THE DIETETIC LABORATORY.

THE DIETARY OF HEALTH AND DISEASE

FOR THE USE OF DIETITIANS, NURSES AND INSTRUCTORS IN THE SCIENCES THAT PERTAIN TO NUTRITION

BY

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ILLUSTRATED

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TO

DR. RICHARD OLDING BEARD

PREFACE.

The purpose of this book is to provide an intermediate text as a basis for instruction in schools of nursing or departments of home economics. The author has attempted to outline the several phases of food chemistry, food preparation, and dietotherapy, and to present the whole subject in as concise a form as possible.

Grateful acknowledgment is made of the suggestions and assistance given by the Instructing Staff and the Student Dietitians of the University Hospital and by Dr. Richard Olding Beard, Dr. George E. Fahr, Dr. James A. Johnson, Dr. Jesse F. McClendon and Dr. Jennings C. Litzenberg.

G. I. T.

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CONTENTS

Suggestions to Instructors in Dietetics xv

CHAPTER I.

Food and its Relations to the Human Body.

Function of Food 17
Classification of Food 18
Composition of Food 18
Proteins 19
Carbohydrates 19
Fats 19
Mineral Matter 19
Water 19
Vitamins 20
Selection of Food 21
Preparation of Food 21
The Service of Food 21
Distribution of Food in the Body 21
Adjuvants of Food 22

CHAPTER II.

The Processes by Which the Body Makes Use of Food.

Digestion 23
Aids to Digestion 23
Physical and Chemical Features of Digestion 24
Bile 25
Absorption 25
Assimilation 25
Metabolism 26
Elimination 26

CHAPTER III.

Water.

Sources of Water 27
Classification 27
Soft Water 27
Hard Water. 27
Mineral Water 28

Occurrence of Water in the Body 28
Uses in the Body 28
Quantity Required by the Body 28
Dietetic Uses 29
Method of Purification 29
Filtration 30
Chemical Action 30
Heat Sterilization 30

CHAPTER IV.

Mineral Matter.

Sources in Food 31
Occurrence in the Body 31
Uses in the Body 32
Relation of Inorganic Salts to Physiological Processes . . 32
Relation to Protective Physiological Mechanisms . . . 33
Relation to Protective Mechanisms in Pathological Processes 33
Relation to Deficiency Diseases 34
Acid- and Base-forming Elements in the Dietary 34
Dietetic Uses of Salts 34

CHAPTER V.

Carbohydrates.

Sources 37
Definition 37
Classification 37
Detail Study 38
Classification of Vegetable Foods 39
Cereals 39
Legumes 39
Roots, Tubers and Bulbs 40
Green Vegetables 40
Fruits 40
Nuts 41
Fungi 41
Algæ 41
Digestion 41
Occurrence in the Body 42
Uses to the Body 42
Dietetic Use 42

CHAPTER VI.

Fats and Oils.

Sources 44
Classification 44
Fixed Fats 44
Summary of Characteristics 46
Cookery of Fats 46

Digestion of Fats 46
Occurrence in the Body 48
Fat-soluble A Vitamin 48
Uses of Fat to the Body 48
Dietetic Uses 48

CHAPTER VII.

Proteins.

Source 50
Composition 50
Description 50
Classification of Proteins 50
Simple Proteins 50
Conjugated Proteins 51
Derived Proteins 51
Test for Proteins 51
Characteristics 51
Putrefaction 52
Uses in the Body 52
Dietetic Uses 52
Precautions 52
The Digestion of Proteins 52
Chemical Digestion of Protein 53

CHAPTER VIII.

The Caloric Values of Food.

Factors Which Control the Food Requirement 54
Weight 55
Climate 56
Age 57
Sex 57

CHAPTER IX.

Weights of Rations of Foods—Table of Caloric Values.

100-Gram Portions of Foods 60
100-Caloric Portions of Food 61
Caloric Value of Food 63

CHAPTER X.

Food Preparation.

Principles of Cookery 66
Reasons for Cooking 66
Esthetic Values of Food 66
Selection of Food 67

Food Measurements—Thermometry—Abbreviations 67
Rules for Measuring 69
Care of the Laboratory 69
Rules for Washing Dishes 70
Care of Sink 72
Care of Refrigerator 72
Care of Garbage Can 72
Duties of Housekeepers in Dietetic Classes 73

CHAPTER XI.

Beverages.

Acid Beverages 74
Stimulating Beverages 74
Farinaceous Beverages 74
Albuminous Beverages 74
Recipes 75

CHAPTER XII.

Cream Sauces.

Cream Soups 82
Food Values 82
General Directions for Preparing Cream Soups 82

CHAPTER XIII.

Eggs.

Food Value 86
Digestibility 86
Tests for Fresh Eggs 86
Preservation 86
Cookery of Eggs 87
Custard 88
Soft Custard 88
Baked Custard 88

CHAPTER XIV.

Milk.

Food Value of Milk 90
Digestibility of Milk 91
Souring of Milk 91
Certified Milk 91
Pasteurized Milk 91
Sterilized Milk 92
Koumyss 92
Peptonized Milk 92
Malted Milk 93

CHAPTER XV.

Starch—Cereals—Vegetables.

Cooking of Starch 95
Cooking of Cereals 95
Cooking of Vegetables 96

CHAPTER XVI.

Gelatin.

Food Value 101
Effect of Water on Gelatin 101

CHAPTER XVII.

Desserts.

Food Value 104

CHAPTER XVIII.

Frozen Desserts 111

CHAPTER XIX.

Salads.

Composition 115
Food Value 115
Essential Points to be Observed in Making Salads 115
Classes of Salad Dressing 116
Salads and Salad Dressings 116

CHAPTER XX.

Flour Mixtures.

Digestibility 119
Toast 119
Leavening Agents 119
Flour 120
Oven Tests 120
To Test Complete Baking 121

CHAPTER XXI.

Cake.

Classification 123
How to Tell When a Cake is Cooked 123
The Four Stages of Cake-baking 123
The Care of Cake after Baking 124
Flour 124

CHAPTER XXII.

Meat.

Definition 128
Physical Structure 128
Protein Constituents of Meat 128
Mineral Content of Meat 130
Food Value 130
Tests for Good Meat 130
Care of Meat in the Home 130
Method of Cooking Meat 130

CHAPTER XXIII.

Fish.

Selection 134
To Prepare Fish for Cooking 134
Methods of Cooking 135

CHAPTER XXIV.

Poultry.

Selection 137
Digestibility 137
Preparation 137
To Prepare Giblets for Cooking 138
To Truss a Fowl 138
To Cut a Fowl for Frying or Stewing 138

CHAPTER XXV.

Modified Recipes for Cases Requiring Special Dietary Considerations.

Modification of Recipes 142
Diabetic Cookery 142
Desserts 147

CHAPTER XXVI.

Diet for the Various Periods of Life.

Preparation of Infant Feedings 154
Equipment for Preparation of Feedings 155
Materials for Food Preparation 155
Milk Mixtures in Common Use 157

Diets for Children 160
Adolescence 164
Maternity 164
Old Age 165

CHAPTER XXVII.

Dietary Conditions for the Sick.

The Tray 166
Precautions 167
To Prepare the Tray 168

CHAPTER XXVIII.

Diet in Disease.

Dietetic Treatment of Fevers 170
Dietary of Typhoid Fever 171
Disorders of Metabolism 173
Diabetes 173
Typical Diabetic Diet 176
Diseases of the Liver 177
Typical Fat-free Diet 177
Obesity 177
Diet for the Obese 178
Goiter 179
The Purin-free Diet 179
Gastro-intestinal Disorders 181
Gastritis 181
Chronic Gastritis 181
Seven-hour Motor Meal 181
Gastric Atony 182
Gastro-enteritis 182
Mucous Colitis 182
Gastric Ulcer 183
Sippy Diet 183
Acute Dysentery 184
Chronic Dysentery 184
Constipation 185
Constipation Diet 185
Renal Disturbances 186
Acute Nephritis 186
Chronic Nephritis 186
Restricted Protein Diet 186
Renal Test Meal 186
Mosenthal or Renal Test Diet 187
Salt-free Diet 188
Amount of Salt in a Salt-free Diet 189
Salt Content of Foods 190
Cardiac Conditions 191
Decompensated Heart 191
Decompensated Heart with Edema 191

Miscellaneous Disorders 192
Anemia 192
Hypertension 192
Disorders of the Skin 193
Eczema 193
Rice Diet 193

CHAPTER XXIX.

Diet under Special Circumstances.

Diet in Deficiency Disturbances 194
Diets in Surgical Cases 195
Admission of Patient 195
Preparatory Treatment 195
Local Anesthesia 195
Postoperative Treatment 195
Diet in Pregnancy 197
Prochownick Diet 198
Cases Requiring High Caloric-feeding 199

SUGGESTIONS TO INSTRUCTORS IN DIETETICS.

A Course in Dietetics May Be Covered in Sixty-eight Hours Following This Outline

Hours 1 to 12—*Theoretical dietetics.*

1. Food and its relation to the human body.
   Topic for study and report. Vitamins.
   Reference. McCollum, The Newer Knowledge of Nutrition. (Macmillan.)
2. Processes by which the body utilizes food.
   Topic for study and report. Mechanical digestion; suggestions in aid of digestion by food preparation.
   Reference. Pettibone, Physiological Chemistry. (Mosby Co.)
3. Water.
   Topic for study and report. Inspection of water plants. The source, purification and storage of water.
   Reference. Rosenau, Preventive Medicine and Hygiene. (Appleton.)
4. Minerals.
   Topic for study and report. The utilization of calcium and phosphorus by the body.
   Reference. Sherman, Chemistry of Food and Nutrition. (Macmillan.)
5. Carbohydrates.
   Topic for study and report. A diet for a single day, including only carbohydrate foodstuffs containing 5 per cent and 10 per cent of carbohydrate material.
   Reference. Locke, Food Values. (Appleton.)

6. Written review.
7. Fats.
   Topic for study and report. Commercial soap-making.
   Reference. Hutchinson, Practical Dietetics. (Wood.)
8. Protein.
   Topic for study and report. Milk supply as a municipal problem.
   Reference. Rosenau, Preventive Medicine and Hygiene. (Appleton.)
9. Caloric values.
   Topic for study and report. Calculation of personal caloric requirement; menu for one day to satisfy requirement.
   Reference. Atwater and Bryant, Farmers' Bulletins, Nos. 142 and 28, U. S. Department of Agriculture.
10. Conditions of the sick affecting diet.
    Topic for study and report. A menu for one day for a patient on liquid, semisolid, light and general diet.
    Reference. Perry, Essentials of Dietetics for Nurses. (Mosby Co.)
11. Diet for the various periods of life.
    Topic for study and report. Provide a menu for one day to satisfy the following caloric requirements:

Child of	4	years	of age.
Boy of	12	"	"
Girl of	16	"	"
Woman of	30	"	"
Man of	80	"	"

Reference. Atwater and Bryant, Farmers' Bulletin, No. 142, U. S. Department of Agriculture.

12. Final examination.

Hours 13 to 60—*Laboratory course in practical dietetics.* This provides for 24 two-hour classes.

1. Food preparation, beverages.
2. Beverages (continued).
3. Cream sauces and soups.
4. Eggs.
5. Milk.
6. Infant-feeding.
7. Preparation of a breakfast tray.
8. Vegetables.
9. Gelatin.
10. Desserts.
11. Frozen mixtures.
12. Written lesson.
13. Vegetables, salads and dressings.
14. Fruits, salads and dressings.
15. Flour mixtures.
16. Inspection of flour mill.
17. Cakes.
18. Meats.
19. Inspection of packing house.
20. Fish.
21. Fowl.
22. Diabetic cookery.
23. Table-setting. Menu-making.
    Refererence. Hill, The Up-to-date Waitress. (Little & Brown.)
24. Demonstration.

Hours 60 to 68—*Dietotherapy.*

1. Fevers.
   Topic for study and report. A diet for acute fever patient; diet for fever of long duration.
2. Disorders of metabolism.
   Topic for study and report. A diet for the following conditions:
   1. Diabetes.
   2. Liver disturbances.
   3. Obesity.
   4. Gout.
3. Gastro-intestinal disorders.
   Topic for study and report. A diet for each of these conditions:
   1. Gastritis.
   2. Gastric atony.
   3. Gastro-enteritis.
   4. Mucous colitis.
4. Renal disturbances.
   Topic for study and report. A diet for the care of acute nephritis, chronic nephritis.
5. Cardiac conditions.
   Topic for study and report. A diet for a patient with a decompensated heart with edema.
6. Miscellaneous disorders.
   Topic for study and report. A diet for a case of hypertension, rickets and forced feeding.
7. Diets for surgical patients.
   Topic for study and report. Oral review.
8. Written examination.

DIETARY IN HEALTH AND DISEASE.

CHAPTER I.

FOOD AND ITS RELATIONS TO THE HUMAN BODY.

A KNOWLEDGE of dietetics is protective. Dietetics deals with the derivation of the greatest nutritive values from a proper combination of foods at a minimum amount of effort upon the part of the body. Nutritive values are liable to damage in the preparation of food. Food supply to the human body is primarily a selective problem. The processes by which the body makes use of the food may become so prejudiced by dietetic error that certain serious disturbances result.

Dietetics is the science of feeding. It involves a study of the functions of food, its composition, selection, preparation and service. It should extend to the study of the processes by which foods are utilized in the human body.

Function of Food.—Foods are materials which when taken into the body:

1. Yield energy to the tissue cells.
2. Build and repair tissues.
3. Regulate the body processes.

The energy of the tissue cells is derived from the food-stuffs. It is converted in these cells in the process of their growth and repair. Functional activity involves the breaking down of tissue material and the consequent liberation of

energy. Catalytic and oxidative processes are involved in these transformations. Oxidation of waste materials may be compared to the combustion of fuel. An end-result is the maintenance of body temperature, regulated not only by the production of heat as the result of tissue change, but also through the agencies of heat loss by radiation, conduction and evaporation from the body surfaces by aid of the circulation, the respiration, secretion and excretion.

Certain food materials are susceptible of storage in the tissues, and these stores may be mobilized in underfeeding, fasting, starvation or disease. Losses of weight result.

The functional processes involved in the utilization of food, the conversion of energy, the development and breaking down of tissue cells are termed metabolism.

Metabolism has two phases:

(*a*) Anabolism, or the building up of tissue complexes.

(*b*) Katabolism, or the breaking-down of tissue materials.

Classification of Food.—Foods may be classified in two principal groups:

Inorganic Foods.—Water, oxygen, mineral matter.

Organic Foods.—Proteins, fats, carbohydrates.

Composition of Food.—Fifteen chemical elements are found in the human body. A table of these chemical elements, for a person weighing 148 pounds, is as follows:

	Pounds.		Pounds.
Oxygen	92.4	Chlorine	0.12
Carbon	31.6	Sodium	0.12
Hydrogen	14.6	Iron	0.02
Nitrogen	4.6	Potassium	0.34
Phosphorus	1.4	Magnesium	0.04
Calcium	2.8	Fluorine	0.02
Sulphur	0.24	Silica	a trace
Iodine	a trace		

The first four are the most important, as they are necessary in the building of muscular and fatty tissue. Certain others

are chiefly used in the structural framework of the body, as the bones, teeth and cartilage.

These elements form food compounds which are classified as follows:

Proteins.—This is the most important food group. It is composed of carbon, hydrogen, oxygen, nitrogen and sulphur. The animal kingdom supplies the proteins, with a few exceptions. The typical protein foods are milk, eggs, meat, cheese, fish, legumes and cereals. The legumes are vegetable proteins and consist of peas, beans and lentils. Cereals which are high in protein content are oatmeal, rice and cornmeal.

Carbohydrates.—These foods contain carbon, hydrogen and oxygen. They are divided into three groups: starches, dextrins and sugars. The carbohydrates are energy contributors. They are derived almost entirely from the vegetable kingdom.

Fats.—The fats contain carbon, hydrogen and oxygen. The oxygen is present only in small amounts. These foods are also called the "hydrocarbons." Fats are obtained from both animal and vegetable foods, and are also energy producers. The principal fats are olein, palmitin and stearin.

Mineral Matter.—Minerals are found in varying quantities in foods. The salts of the tissues and body fluids are: sodium and potassium chlorides, sulphates, phosphates and carbonates; calcium and magnesium phosphates and carbonates. The calcium and magnesium enter into the structure of the framework tissues of the body. The salts are found in greatest quantity in the green vegetables, cereals, milk and the red meats.

Water.—Water is found not only in free form, but in foodstuffs. It consists of hydrogen and oxygen in the proportions of 2 to 1. It is not only a tissue food, but a diluent, a solvent, an agent of transfusion, circulation, suspension, heat regulation and waste elimination.

Vitamins.—Vitamins constitute the sixth group necessary to health and development. They contribute by unknown means to tissue growth and repair. They are variably susceptible to the influences of heat and storage. They are most definitely secured in fresh uncooked foods. The vitamins are divided into three known classes:

VITAMIN CONTENT OF FOOD FROM EXPERIMENTS OF DR. J. F. MCCLENDON.

Found in	Fat soluble A.			Water soluble B. Anti-neuritic.	Water soluble C. Anti-scorbutic.
	(a) Growth.	(b) Anti-ophthalmic.	(c) Anti-rachitic.		
Butter	++	++	++	○	○
Casein	○	○	○	○	○
Crisco	○	○	○	○	○
Cotton-seed oil	+	?	?	○	○
Cod-liver oil	++++	++++	++++	○	○
Figs, dried	+	+	+	+	+
Flour:					
Patent	○	○	○	+	○
Clear	○	○	○	++	○
Red dog	+	○	○	++	○
Whole wheat	+	○	○	+++	○
Jam, raspberry	○	○	○	○	○
Meat	+	+	+	+	○
Milk	++	++	++	++	++
Milk, dried	+	+	+	+	○
Orange peel	+	?	?	+	+
Orange juice	○	○	○	+	++++
Orange, dried	+	+	+	+	++++
Peaches:					
Dried	+	+	+	+	+
Canned	+	+	+	+	+
Spinach, dried	++	++	○	+	○
Sugar	○	○	○	○	○
Starch	○	○	○	○	○
Salts	○	○	○	○	○
Wheat germ	+	○?	○	++++	○
Yeast	○	○	○	++++	○
Deficiency of these materials is believed responsible for:	Retardation of growth.	Xerophthalmia.	Rickets.	Beriberi, neuritis.	Scurvy or scorbutus.

Selection of Food.—A combination of foodstuffs is necessary to promote nutrition. Milk approaches to an ideal food, as it contains the five food principles in a most digestible form and supplies vitamins. It has, however, a high-water content, which renders it too dilute a food for adult use. It lacks mass, a necessary feature for the promotion of motility.

It is essential that a certain moderate amount of protein food be taken. The nitrogen taken into the body and the nitrogen excreted should balance. When the intake exceeds the output, it usually means that nitrogenous tissue is being built. The reverse indicates the breaking down of nitrogenous tissue.

A normal appetite is something of a guide to food selection. Cereals, lacking in fat, suggest the addition of cream, milk and butter; meats, lacking in carbohydrates, suggest the association with them of bread or potatoes.

Preparation of Food.—The preparation of food is a vital matter. Food values may be improved or impaired by application of heat. The carbohydrates are rendered more digestible by cooking; the proteins are coagulated and their food values diminished upon the application of too high or prolonged heat. The fats are impaired by intense heat, a chemical change taking place which produces substances irritating to the gastro-intestinal tract.

The Service of Food.—This suggests a study of the esthetic side of the food problem. Experiments show that food values are enhanced or impaired by their influence upon the special senses. Food by its appeal to the sight, smell and taste of the patient stimulates the flow of the digestive juices, and thus it is readily utilized.

Distribution of Food in the Body.—Food is distributed in the body by the blood and lymph. The blood consists of red and white corpuscles and plasma. The red corpuscles carry oxygen from the lungs; the white corpuscles are food

carriers and defense agencies against microörganisms. The plasma of blood and lymph contains water, salts, dextrose, soluble proteins, emulsified fats, etc., all of nutritive value. It carries, also, carbon oxide and both nitrogenous and non-nitrogenous forms of waste material for elimination through the organs of excretion. A considerable mass of the débris of food, by way of undigested or indigestible material, together with large numbers of bacteria which tend to the destruction of this débris, remains to be removed from the lower bowel.

Adjuvants of Food.—To human food, substances of indifferent nutritive value are commonly added as variants of flavor and promoters of appetite and digestion. These include spices and other condiments and certain stimulating beverages such as tea, coffee, etc.

BIBLIOGRAPHY.

McCollum: The Newer Knowledge of Nutrition (Macmillan).
Graves: Modern Dietetics (The Modern Hospital Publishing Company).
Proudfit: Dietetics for Nurses (Macmillan).
Lusk: Elements of the Science of Nutrition (Saunders).
Forchheimer and Coleman: The Therapeusis of Internal Medicine (Appleton).

The following Farmers' Bulletins may be obtained for a small sum upon application to the U. S. Department of Agriculture. They contain interesting and useful material, and may be used in connection with this course:

American Food Materials, No. 28.
Use of Fruit as a Food, No. 293.
Preparation of Vegetables for Table, No. 256.
Beans, Peas and Other Legumes as Food, No. 121.
Poultry as Food, No. 182.
Meats, Composition and Cookery, No. 34.
Nuts and Their Uses as Food, No. 332.
Eggs and Their Uses as Food, No. 128.
Economical Use of Meat in the Home, No. 391.
Potatoes, etc., as Food, No. 295.
Sugar and its Value as Food, No. 535.
Cereal Breakfast Foods, No. 249.
Bacteria in Milk, No. 490.
The Use of Milk as Food, No. 363.
Principles of Nutrition, No. 142.
Cheese and its Uses in the Diet, No. 487.
Care of Food in the Home, No. 375.
Fish as Food, No. 85.
Care of Milk and its Use in the Home, No. 413.

CHAPTER II.

THE PROCESSES BY WHICH THE BODY MAKES USE OF FOOD.

The processes by which the body makes use of food are digestion, absorption, assimilation, metabolism and elimination.

Digestion.—The sum of the changes which food undergoes to put it into such a form that it can be absorbed and distributed is called digestion. By cooking and other means of preparation a certain measure of this work may be accomplished, and this external digestion made to save the labor of the digestive tract. In digestion the following changes take place:

1. Solid or semisolid foods are reduced to soluble form.

2. Carbohydrates are broken down into single sugars; some indigestible material remains which is valuable in the dietary. It may be called roughage. It is helpful to the digestion in that it stimulates the intestinal lining by direct contact and provokes vigorous muscular reactions by mass. It carries along with it other forms of débris which have not the necessary bulk to provoke peristalsis.

3. Proteins are reduced to proteoses, peptones and finally to polypeptids and amino-acids.

4. Fats break down into glycerol and fatty acids.

5. Salts only require solution and dilution, to which water contributes, as it does to the solution and transfusion of other products of digestion.

Aids to Digestion.—Digestion may be aided in a number of ways:

1. Food should be thoroughly masticated, thus assisting dilution and solution and increasing its surface of exposure to and permeation by the digestive juices.

2. Concentrated foods such as candy, cheese or nuts should be taken in combination with other foods which serve to dilute them.

3. Food should not be eaten when one is fatigued or suffering from severe nervous strain.

4. Digestion is influenced by the amount of food taken at a time; quantity proportioned to the capacity of the stomach promotes ready digestion.

5. Well-balanced meals are more easily digested than those in which single foods are served in excess.

6. Food well cooked and artistically served promotes the flow of "appetite juices," and so favors digestion.

7. In extreme cases of faulty digestion, food may be predigested; peptonized milk, twice-baked bread and emulsified fats are illustrations of methods.

Physical and Chemical Features of Digestion.—Digestive changes take place, in the alimentary canal, as the result of the mechanical disintegration of food by the teeth and by the muscular movements of the stomach and intestinal walls and by its dilution with the water of the digestive fluids. By these measures the easier penetration of the food by the digestive juices is secured.

The chief factors in the chemical digestion of food are the ferments or enzymes which are present in the digestive juices. These juices are secreted by the salivary and gastric glands, the pancreas, the liver and the intestinal glands.

The enzymes are associated with proteins and are themselves digested in turn by the action of successive ferments. Each ferment acts only upon one class of substance.

Place of action.	Place of origin.	Secretion.	Enzymes.	Function.	Chemical reaction.
Mouth	Salivary glands	Saliva	Ptyalin	Converts starch into maltose	Alkaline.
Stomach	Gastric follicles	Gastric juice	Pepsin	Converts proteins into proteoses and peptones	Acid.
			Rennin	Coagulates casein of milk	
Small intestine	Pancreas	Pancreatic juice	Amylopsin	Converts starch into maltose	Alkaline.
			Trypsin	Splits proteoses into peptones, polypeptids and amino-acids	
			Lipase	Splits fats into fatty acids and glycerin	
Small intestine	Intestinal glands	Intestinal juice	Maltase Lactase Sucrase	Changes double sugars to dextrose, levulose, galactose, etc.	
			Erepsin	Splits peptones into amino-acids	
Small intestine	Liver	Bile	None	Emulsifies and promotes absorption of fats	Alkaline.

Bile.—The bile in addition to emulsifying and promoting the absorption of fats, stimulates peristalsis, limits bacterial growth, and neutralizes the acid output of the stomach.

Absorption.—No absorption takes place in the mouth and ordinarily none in the stomach. This process takes place in the small intestine and to certain extent in the large bowel. The surface of the small intestine is furnished with tiny projections called villi. These villi contain capillary blood-vessels and lymph radicals, through the thin walls of which digested foods are absorbed into the blood and lymph stream, and are thus distributed to the tissue cells. The leukocytes, or white cells of the blood and lymph, assist in taking up food materials, and especially fats.

Assimilation.—This is the process by which the tissue cells select or appropriate food materials. It is a function of all living cells.

Metabolism.—This is the function by which food material, so assimilated, is converted into tissue material and by which the latter is ultimately changed into waste material.

Elimination.—The kidneys, the skin and the air passages are organs of elimination. The large intestine absorbs water and salts and evacuates the remaining débris of digestion. It is not, properly speaking, an organ of excretion.

BIBLIOGRAPHY.

Pettibone: Physiological Chemistry (Mosby).
Carter, Howe and Mason: Nutrition and Clinical Dietetics (Lea & Febiger).
Friedenwald and Ruhr: Diet in Health and Disease (Saunders).

CHAPTER III.

WATER.

Sources of Water.—The composition of water is two parts of hydrogen to one part of oxygen. Its sources are lakes, rivers, springs, wells or rainfall. Water is pure in its first molecular state but collects impurities readily as a result of its highly solvent power. Water which comes from a great height or a great depth is considered the most certainly pure. As water dissolves solids, liquids and gases, therein lies its danger of contamination, and especially if the water travels far from its source.

The rain-water collected at the close of a storm is pure but tasteless, owing to the lack of mineral matter and oxygen. Water coming from surface sources may carry with it the products of decomposition of organic matter, impurities resulting from sewage or animal excreta, physical impurities of various sorts and a greater or less percentage of minerals.

Classification.—1. *Soft water* is a relative term: it is water containing a small, but variably small, amount of mineral matter. Water regarded as soft in one part of the country may be regarded as hard in another.

2. *Hard water* is water containing calcium or magnesium salts to excess. It is not good for drinking purposes unless boiled. These salts can usually be precipitated sufficiently by boiling to make it possible to use a hard water for drinking purposes. Hard water is unpleasant to the skin if used for bathing purposes. Bladder and kidney-stone cases are said to be more prevalent in localities where hard water is habitually used for drinking.

3. *Mineral water* is water coming from the soil rich in minerals, and carries with it salts of iron, magnesium, sodium, potassium, lithium, etc. Mineral waters are not advised as beverages for constant use, but are sometimes used in large quantity for medicinal purposes over periods of time.

Occurrence of Water in the Body.—Two-thirds of the body weight is water. Water exists in combination with other materials in the body, and as free water it is eliminated. Under ordinary conditions the body maintains a certain water equilibrium, and the quantity of water taken into the body determines more or less closely the quantity eliminated by the skin, the air passages, kidneys and large intestine. The quantity contained in the body fluids and held in the tissue cells may be temporarily increased in considerable measure. Water retention is one of the factors in the development of edema or dropsy.

Uses in the Body.—1. Water enters into the composition of all the tissues and fluids of the body.

2. It dilutes the blood and the lymph, serving as an agent of the circulation.

3. It is a vehicle for the elimination of waste material from the body.

4. It acts, through its evaporation from the body surfaces, as a regulator of body temperature.

5. It aids digestion by the dilution of foods and of the digestive fluids.

6. It aids in absorption and assimilation as an agent of transfusion.

Quantity Required by the Body.—If there is a deficiency of water the body suffers. Six to eight pints of water a day is needed; almost half of this can be counted upon as being taken in with the food, as foods that are to all appearances solid contain 20 per cent or more of water and many contain

as high as 90 per cent. Water should be taken freely between meals, early in the morning and at night. Moderate quantities may be ingested with meals without prejudice to digestion.

Dietetic Uses.—1. Hot water is advised in the treatment of indigestion; it increases the dilatation of arterioles in the stomach and intestines.

2. Cold water is stimulating to the digestive organs of people who are in good health and serves to promote elimination.

3. Lukewarm water (90° F.) acts as an emetic when taken in large quantities.

4. Whenever fluid has been actively withdrawn from the tissues by hemorrhage or diarrhea, water is immediately and freely given to compensate the loss.

5. In fever, water supply is urged to meet the greater loss it evolves.

6. In event of the retention of nitrogenous waste material, water is often given with the idea of promoting a free flush of the tissue cells.

7. In certain disorders such as cardiac cases with edema, or in nephritis with edema, water is restricted. It is also restricted by some physicians in hypertension on account of its increase of the volume of the blood.

8. If constipation is due to too great an absorption of fluid from the contents of the large intestine, certain substances such as agar-agar, vegetable fiber foods, etc., are given as convenient water retainers.

Methods of Purification.—Distillation is one of the surest methods. Distilled water should be aërated to render it palatable. It is used in compounding medicines, in times of epidemic and on board ship.

Filtration.—This method is only reliable when competent and clean filtering materials are used. However, the history of epidemics shows that localities in which filtered water is used will be free from water-borne diseases while those using unfiltered water will not. A filter must be kept in perfect condition, whether it is of the small domestic type attached to the faucet in the home or the large sand-beds used in filtering a city water supply.

Chemical Action.—This is the least desirable method. It is harmless, but frequently alters the taste of the water. Chemicals are used as coagulants of the physical and bacterial impurities and as sterilizers of water.

Heat Sterilization.—This is a reliable method. While boiled water tastes flat, it can be aërated by pouring it from a height. Boiling also tends to eliminate an excess of lime.

For ordinary purposes, distilled water, soft water or boiled water are not recommended except in times of epidemic danger. The few grains of lime salts to the gallon that ordinary drinking water contains are not objectionable.

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CHAPTER IV.

MINERAL MATTER.

Sources in Food.—1. Minerals or salts are contained in the ordinary mixed diet in sufficient quantity to maintain nutrition, with the exception of sodium chloride. The mineral supply comes from both vegetable and animal foods. Somewhere in the growth of the plant the inorganic salts are built into its structure and often changed into organic salts that can be utilized. Sodium chloride is obtained from the evaporation of sea water or from mines.

2. Vegetables and cereals are rich in phosphorus, iron and calcium.

3. Animal foods are rich in phosphorus, iron and sulphur.

4. Fruits and vegetables contain vegetable salts, as citrates, malates, tartrates and benzoates. These organic salts are readily decomposed, their acids are oxidized, while their bases combine with carbon dioxide to form carbonates and so serve to increase the alkalinity of the body fluids.

5. Water is another source of mineral matter. Mineral waters are classified according to the inorganic salts they contain, as lithia waters, iron waters, sulphur waters, etc. The lithia waters are supposed to be valuable in gout and in certain disorders of the kidneys, and iron and sulphur waters to improve conditions of the blood and the skin. These, however, are therapeutic rather than dietetic measures.

Occurrence in the Body.—From 4 to 5 per cent of the body weight is of mineral matter. It is found in all tissues and fluids, but especially in the bones, teeth and cartilage. It is found in the various compounds of sodium, potassium, phosphorus, calcium, sulphur, magnesium, chlorine and iron.

The minerals only require dilution and solution for their

digestion and absorption. They are eliminated mainly through the kidneys.

Uses in the Body.—1. *Relation of Inorganic Salts to Physiological Processes.*—(*a*) Rigidity and growth of the skeleton. The inorganic salts have a definite relation to normal body structures and to normal physiological processes. The rigidity of the skeleton, the hardness of the teeth and the resistance of cartilage, for example, depend on the deposition of salts, chiefly calcium phosphate and calcium carbonate. Growth of the above structures during childhood and their repair in later life are accomplished by laying down inorganic salts in a framework of living cells.

(*b*) *Digestion.*—In digestion the salts play their role in various ways. The hydrochloric acid essential to gastric digestion is thought to be derived from the sodium chloride intake. Clotting of milk in the stomach depends on the presence of calcium, without which no coagulation occurs.

(*c*) *Metabolism.*—The metabolic exchange which occurs between the living cells and the body fluids, and the passage of these fluids through the vessel walls into the tissue spaces and back again, are accomplished by means of osmosis, which is governed by the salt concentration of the fluids involved. The osmotic pressure of the cells and body fluids, which is so important in cell nutrition, must be regulated by the salt content. The cells of the body are constantly bathed in plasma which escapes from the vessels to a very large extent as a result of differences in osmotic pressure. A nicety of balance between the osmotic pressure of the blood and of the intercellular fluid is required for the normal functions of the tissues bathed by this fluid. Any disturbance in this balance results in a pathological condition. Although the causes of edema are very imperfectly understood, still it is believed that an accumulation of salts in the tissues accounts for the drawing out of fluid from the bloodvessels into the tissue spaces.

(*d*) *Activation of Enzymes.*—The activation of digestive enzymes such as trypsin may depend upon the salts in the intestinal tract.

(*e*) *Irritability of Muscles and Nerves.*—The irritability of muscle and nerve tissues has been shown to depend in part upon the calcium, sodium and potassium present.

(*f*) *Blood.*—Iron in the hemoglobin molecule, although small in amount, is essential to the important oxygen-carrying function of the blood.

2. *Relation to Protective Physiological Mechanisms.*—(*a*) *Normal Alkalinity of Blood.*—The normal alkalinity of the blood is maintained by an excess of sodium bicarbonate, which affords what is called the "buffer value" of the blood. The acid products of metabolism are rendered neutral without changing the alkalinity of the blood and the tissue juices, the sodium bicarbonate constituting a "buffer" or factor of safety against a dangerous tendency toward acidosis. In a series of experiments on dogs, fatal results were produced by absolute salt starvation. Upon the decomposition of protein in the body the sulphur which it contains forms sulphuric acid, which under a normal diet would have united with the basic salts of the foods. These basic salts being absent, the acid unites with the basic elements of the living cells, producing acidosis and serious nutritional derangement.

(*b*) *Clotting of Blood.*—The salts are made use of in certain normal protective body mechanisms such as the clotting of blood, which depends on the presence of calcium.

3. *Relation to Protective Mechanisms in Pathological Processes.*—(*a*) *Repair of Fractured Bones.*—In the repair of destructive or pathological processes the salts are often used. The parts of a fractured bone are reunited by laying down new bone with its salt content to bridge the separated parts.

(*b*) *Calcification in Tuberculosis.*—In tuberculosis of the lungs, diseased areas often heal and finally become obliterated by the deposit of calcium salts.

4. *Relation to Deficiency Diseases.*—When for any reason the salt content of the diet is inadequate, or when the body loses the power to synthesize the salts present in the food, well-defined pathological conditions result. In rickets the mechanism of laying down calcium phosphate in the bones is at fault and results in the soft bones of the rachitic child with his soft, box-shaped head and bowed legs.

Acid- and Base-forming Elements in the Dietary.—The question of acid-forming and base-forming elements in the diet is an important one. In the course of metabolic transformation the chlorine, sulphur and phosphorus of the foodstuffs yield acids, whereas the sodium potassium, calcium and magnesium yield bases. The normal dietary should be one which should yield at least sufficient base-forming elements to neutralize the acids formed. If these acids are not neutralized by the bases of the diet they must be neutralized by the fixed bases of the tissues. We then have a serious pathological condition which embraces one of the most harmful features of acidoses. Meat and eggs are rather pronounced acid-forming foods, whereas the grain products are acid-forming to a less degree. Milk is a base-forming food while vegetables and fruits are base-formers to a marked degree. The reason the fruits, which may be initially acid, yield an excess of bases on oxidation is the fact that their acidity is caused by organic acids, present for the most part as acid potassium and sodium salts, and these salts, readily dissociated by carbon dioxide, yield potassium carbonate and bicarbonate.

Dietetic Uses of Salts.—Aside from the constant need of minerals, there are conditions under which the body needs a larger supply.

1. Growing children need the calcium salts for bone-building and the phosphorus and the iron salts to maintain rapid tissue-building in general. Eggs, cereals, milk and vegetables are indicated.

2. Convalescents or anemic patients require iron and phosphorus.

3. During pregnancy and lactation, larger supplies of calcium and phosphorus are necessary, or the calcium for the development of the child may be drawn from the mother's structure.

4. In edema sodium chloride is withheld from the diet. The body maintains a certain concentration of this salt, therefore if the intake of sodium chloride is reduced, elimination of water from the body results.

FOODS ARRANGED IN ORDER OF GREATEST RICHNESS.[1]

Foods rich in iron.	Per cent.	Foods poor in iron.
Egg-yolk	0.0086	Bread, white
Lentils	0.0086	Candy
Gluten bread (40 per cent)	0.0079	Carrots
Wheat bran	0.0078	Cheese
Molasses	0.0073	Corn flakes
Lima beans (dry)	0.0070	Corn meal
Dock greens	0.0065	Corn syrup
Peas (dry)	0.0057	Corn starch
Whole wheat	0.0050	Crackers
Hazelnuts	0.0041	Cream
Almonds	0.0039	Egg white
Spinach	0.0036	Fats and oils
Beefsteak	0.0032	Fish
Chicken	0.0032	Hominy
Dates	0.0030	Macaroni
Eggs, whole	0.0030	Milk
Figs, dried	0.0030	Oysters
Maple syrup	0.0030	Potatoes
Prunes	0.0030	Rice
Dandelion greens	0.0027	Rice flakes
Chard	0.0025	Sugar
Graham bread	0.0025	Tomatoes
Tenderloin	0.0024	Turnips
Mutton	0.0023	
Raisins	0.0021	
Walnuts	0.0021	
Bacon	0.0016	

[1] Excerpt from the New Dietetics (revised), by John Harvey Kellogg, M.D.

Foods rich in lime.	Per cent.	Foods poor in lime.
Cheese	1.32	Beef
Mustard greens	0.69	Bread, white
Turnip tops	0.49	Candy
Hazelnuts	0.40	Chicken
Almonds	0.34	Corn flakes
Cottage cheese	0.30	Corn meal
Molasses	0.30	Crackers
Dock greens	0.23	Fats and oils
Beans (dry)	0.23	Fish
Figs (dried)	0.22	Fruit
Chard	0.21	Hominy
Egg yolk	0.19	Macaroni
Cauliflower	0.17	Mutton
Milk	0.17	Oysters
Milk (skimmed)	0.17	Rice
Wheat bran	0.17	Rice flakes
Dandelion greens	0.15	Sugar, white
Lentils (dried)	0.15	
Maple syrup	0.15	
Peas (dried)	0.12	
Spinach	0.11	
Eggs, whole	0.09	

Foods rich in both lime and iron.	Foods poor in both lime and iron.
Beans	Bread, white
Bran	Candy
Chard	Corn flakes
Eggs	Corn meal
Figs	Corn syrup
Gluten bread	Crackers
Greens	Fats and oil
Lentils	Fish
Maple sugar	Hominy
Molasses	Oysters
	Rice
	Rice flakes
	Sugar
	Tomatoes

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CHAPTER V.

CARBOHYDRATES.

Sources.—The carbohydrates are found in varying percentage in the composition of vegetable foods. In the animal foodstuffs they are found in any quantity only in the liver and muscles in the form of glycogen, while very minute quantities of dextrose are in solution in the blood and of lactose in milk.

Definition.—The carbohydrates are compounds of carbon, hydrogen and oxygen. The C is in the form of C_6 or some multiple of 6 and the H and O are always in the proportion to form water. The four typical groups in this class of physiological or dietetic interest are starches, dextrins, sugars, vegetable gums and woody fibers.

Classification.—A classification of the carbohydrates based upon their chemical composition, but in physiological order, is as follows:

(*a*) Polysaccharids or starch group, $C_6H_{10}O_5$.
1. Starch.
2. Cellulose.
3. Dextrins.

(*b*) Disaccharids or double sugar group, $C_{12}H_{22}O_{11}$.
1. Sucrose.
2. Lactose.
3. Maltose.

(*c*) Monosaccharids or single sugar group, $C_6H_{12}O_6$.
1. Dextrose.
2. Levulose.
3. Galactose.

Detailed Study of Each Group.—1. *Starch*, sugar and woody fiber are found together in plants. Starch is the reserve or stored food material of plant life. It is found in the storehouses of plants as the roots, seeds and underground stems. It is partly changed to dextrin or to maltose by the action of diastase as the seed ripens and the plant grows. The starch granule is covered with a delicate envelope of cellulose. Hot water and long cooking break down this covering, which otherwise makes the starch impossible of digestion.

Cellulose is of value to the diet, as it contributes bulk to the food, encouraging muscular activity in the intestines. It constitutes the structural framework of plant cells and is abundant throughout the vegetable kingdom.

2. *Dextrins* are formed in the hydrolysis of starch to dextrose. They are readily soluble in water.

Glycogen is a form of dextrin and serves as a reserve food supply, stored in the liver and other tissues of animals. It is readily converted into dextrose.

3. *Gums* are amorphous carbohydrates which exist in the juices of nearly all plants. They have the property of taking up water and forming a thick, sticky mass.

4. *Maltose* is a vegetable and digestive product obtained by treating gelatinized starch with a ferment. In the body the ferments are ptyalin and amylopsin; in plants, diastase.

Diastase is a substance formed from the albumin of seeds during germination. Maltose is much sweeter than glucose. In its physiological form it is the least liable to fermentation of the double sugars. It is easily split into two molecules of dextrose.

5. *Lactose*, or milk sugar, is found in the milk of all mammals. It is obtained in commercial form by evaporating clear, fresh whey from which all fat and albumin have been removed. It is less sweet and soluble than cane sugar; it

feels gritty in the mouth and does not ferment so easily as cane sugar.

6. *Sucrose* (cane sugar, beet sugar) is one of the most important and popular forms of food. It is obtained from both the sugar cane and the sugar beet. It is absorbed in the form of dextrose and levulose. In strong solutions it irritates the alimentary canal and is apt to undergo fermentation. According to Hutchinson, 4 ounces of sugar can be taken by a healthy individual per day. More is rapidly excreted by the kidneys, giving rise to glycosuria. However, the "carbohydrate limit," or capacity for handling carbohydrate food, varies with the individual.

7. *Dextrose*, glucose and grape sugar are found in:

(*a*) Grapes, dates and figs.

(*b*) In smaller quantity in nearly all fruits and honey.

(*c*) In the blood, lymph and tissues of all animals in very small amounts.

8. *Levulose* (fructose or fruit sugar) is similar to dextrose, except that it turns the ray of polarized light to the left. It is a sugar found in fruits and honey and is very expensive and hard to crystallize.

9. *Galactose* is a result of chemical reaction. It is obtained by splitting one of the members of the disaccharid group, lactose, by the agency of certain acids or ferments. Galactose does not ferment easily.

Classification of Vegetable Foods.—1. *Cereals* are the most valuable of vegetable foods. They are ground or pounded into flour or meal. Those commonly used are: wheat, rye, maize, barley, rice, millet, oats and buckwheat.

2. *Legumes* are sometimes called the "meat of the vegetable kingdom," as they contain a liberal amount of protein. Peas, beans and lentils are the best known of the legumes. Although they contain much protein, they are perhaps less

easily digested than meat, a point upon which authorities differ.

3. *Roots, tubers and bulbs* may be grouped together. These are valuable table vegetables on account of their high starch content, but because of their high-water and low-protein content are inferior to either the cereals or to the legumes. Examples of these foods are:

Roots: beets, radishes, carrots, turnips, parsnips.

Tubers: potatoes, Jerusalem artichokes.

Bulbs: onions, leeks, chives, garlic, shallots.

4. *Green vegetables* are valuable, not because of their nutrients, but because of their variety and the bulk they lend to the dietary. They contain valuable salts. Those containing sulphur (cabbage) should be avoided by those of weak digestion. Examples of green vegetables are: lettuce, cabbage, spinach, celery, cauliflower and cress.

5. *Fruits.*

(*a*) Orchard fruits.

1. Pome fruits. Apple (crab apple), pear, quince.
2. Drupe fruits. Apricot, cherry, date, nectarine, peach, plum, persimmon.
3. Citrus fruits. Citron, grapefruit, kumquat, lemon, lime, mandarin, orange and tangarin.

(*b*) Vine fruits.

1. Grapes.

(*c*) Small fruits.

1. Blackberry, black-cap, blueberry, barberry, cranberry, currant (red and white), currant (black), dewberry, elderberry, gooseberry, huckleberry (whortleberry, bilberry), loganberry, mulberry, raspberry, service berry (red and white), squawberry, strawberry.

To this list may be added:

(*d*) Miscellaneous fruits:

1. Agave (alligator pear), banana, bread-fruit, fig guava, mango, olive, papaw, pomegranate, pineapple.

(*e*) Garden fruits:

1. Citron, cucumber, egg-plant, vegetable marrow, melon, cantaloupe, muskmelon, watermelon, pumpkin, squash, tomato.

6. *Nuts* are high in fat, carbohydrate and protein values. They are a very concentrated form of food, and if carefully prepared are not difficult of digestion. Nuts are usually eaten raw and should be thoroughly masticated or ground. Chestnuts contain much starch and are more digestible if cooked.

7. *Fungi.* Two varieties eaten are:

1. Mushrooms, which have little food value and are not readily digested.
2. Truffles, which are an underground fungus. They are valuable as flavoring agents, and are grown in France, Italy and England. There are several varieties, the black being the finest.

8. *Lichens.*—Iceland moss is the most important of the lichens. It is grown in the Arctic regions and used as a food, but it is very difficult of digestion.

9. *Algæ.*—Irish moss is the most important of the algæ. It is a form of seaweed which is used in invalid cookery.[1]

Digestion.—Carbohydrates are broken down and eliminated as CO_2 and H_2O. The various starches, dextrins, etc., are reduced to dextrose by the enzymes and as such are absorbed

[1] Bailey, E. H. S.: Source, Chemistry and Use of Food Products.

and pass into the blood stream. The blood from the intestines passes into the portal vein and is carried to the liver. In the liver and the muscle tissues is stored the reserve supply of carbohydrate material in the form of glycogen. It is readily reconvertible into dextrose and is available whenever the body needs this reserve fuel. If more carbohydrate is taken than is immediately needed, or than can be stored as glycogen, it is probably transformed into fat and stored as adipose tissue.

Occurrence in the Body.—Carbohydrate material is formed as glycogen in the liver and muscles, exists as dextrose in the blood and is formed as lactose, or sugar of milk, in the mammary glands.

Uses to the Body.—1. Carbohydrate is a body reserve in the form of glycogen.

2. It supplies heat and energy in an economical, readily digested and easily mobilized form.

3. An excess of carbohydrate is probably converted into adipose tissue.

Dietetic Uses.—1. Strained carbohydrate cereals are used when there is any inflammation of the food tract.

2. Coarse carbohydrates are used to stimulate peristalsis when there is deficient motility.

3. Concentrated carbohydrates are given when high caloric diets are necessary, as in emaciation or during convalescence.

4. Carbohydrates are restricted in obesity and diabetes.

5. Twice-cooked carbohydrates, as breadstuffs, are given in cases of digestive disturbance.

6. Fresh fruit, fresh vegetables and cereals in the diet are a protection against certain of the deficiency diseases. Examples: scurvy, beriberi, etc.

FOODS ARRANGED APPROXIMATELY ACCORDING TO PERCENTAGE OF CARBOHYDRATES.[1]

5 per cent.		10 per cent.	15 per cent.	20 per cent.
		Vegetables (Fresh or Canned).		
Lettuce	Tomatoes	Pumpkins	Green peas	Potatoes.
Cucumbers	Brussels sprouts	Turnips	Artichokes	Shell beans
Spinach	Watercress	Kohlrabi	Parsnips	Baked beans
Asparagus	Seakale	Squash	Canned Lima beans	Green corn
Rhubarb	Okra	Beets		Boiled rice
Endive	Cauliflower	Carrots		Boiled macaroni
Marrow	Eggplant	Onions		
Sorrel	Cabbage	Mushrooms		
Sauerkraut	Radishes			
Beet greens	Leeks			
Dandelion greens	String beans			
Swiss chard	Broccoli			
Celery				
		Fruits.		
Ripe olives (20% fat)		Oranges	Apples	Plums
Grapefruit		Cranberries	Pears	Bananas
Lemons		Strawberries	Apricots	Prunes
		Blackberries	Blueberries	
		Gooseberries	Cherries	
		Peaches	Currants	
		Pineapple	Raspberries	
		Watermelon	Huckleberries	
		Nuts.		
Butternuts		Brazil nuts	Almonds	Peanuts
		Black walnuts	Walnuts	
Pignolias		Hickory nuts	(English)	*40 per cent*
		Pecans	Beech nuts	Chestnuts
		Filberts	Pistachios	
			Pine nuts	
		Miscellaneous.		
Unsweetened and unspiced pickles, clams, oysters, scallops, liver, fish roe				

[1] Joslin: Diabetic Manual (courtesy of Lea & Febiger).

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CHAPTER VI.

FATS AND OILS.

Sources.—Fats are obtained from both the animal and the vegetable kingdom. In the animal, fats are formed in the connective tissues and in small amounts in the blood and surrounding certain of the abdominal viscera. Foodstuffs of animal origin which classify as fats are butter, bacon, cream, egg-yolk, cod-liver oil, suet, lard and bone marrow.

Bone marrow is a highly nutritious and easily assimilated fat and is often added to the dietary of fevers of long duration if the digestion is not impaired. It is valuable in anemia, as it contributes organic iron as well as hemoglobin and other blood-forming substances. It is obtained commercially from the short ribs of young growing cattle and is prepared in combination with glycerin.

Fat is found in egg-yolk in the form of lecithin. Lecithin is combined with vitellin and is classified under the conjugated proteins as lecitho-protein. Lecithin is a necessary constituent of every living cell. Commercially it is prepared from the yolk of the egg or from brain tissues.

The fats of vegetable origin are found largely in seeds and nuts. They are almost entirely in the form of oils, and are easily digested. Examples of these fats are: olive oil, cottonseed oil, peanut oil and cocoanut oil.

Classification.—Fats may be classified as:

1. Fixed or true fats, which leave a grease stain.

2. Volatile oils, which leave no stain. Flavoring extracts are examples of the latter.

Fixed Fats.—The fats are made up of C H O, the O being small in proportion to the C and H. Fats may be

called salts, since they are in the combination of a base and an organic fatty acid. The base with which the fatty acid unites is always glycerin, but the fatty acid varies.

There are many of these salts, but those physiologically important are stearin, palmitin and olein. Animal fats are usually combinations of these several salts, the texture of the material indicating which salt is present in the greatest quantity.

1. The salts which classify as stearins are solid fats, white or light yellow in color. Tallow is an example of this form. These fats have a high melting point and are not as digestible as the fats with a melting point nearer the body temperature. The fatty acid in stearin is stearic acid.

2. The salts of the palmitin group are softer than the stearin fats and have a lower melting point. Butter is an example of palmitin. The fatty acid in palmitin is palmitic acid.

3. The oleins are oils at ordinary temperature, having a very low melting point. This makes them the more available as foods. Olein is composed of oleic acid and glycerin.

It is interesting to note that all of these fats, melted, solidified and melted again, have acquired a slightly higher melting point. This makes them a little less easy of digestion.

The following table indicates the extent of the utilization of these substances in the body in relation to the melting point of the fat:

Fat.[1]	Melting point. ° C.	Percentage loss in feces.
Pure stearin	60	91–86
Stearin and almond oil	55	10.6
Spermaceti	53	31.0
Mutton fat	50–51	9.2
Lard	43	2.6
Pork fat	34	2.8
Goose fat	25	2.5
Olive oil	fluid	2.3

[1] Carter, Howe and Mann: Nutrition and Clinical Dietetics (Lea & Febiger).

Summary of Characteristics.—1. Fats are composed of C H O. Because of the fact that they contain only a small amount of O in proportion to their C and H they are sometimes called the "hydrocarbons."

2. They have a variable melting point.

3. True fats leave a grease stain.

4. The oils may be subjected to intense heat without burning, hence their value as cooking agents.

5. They are easily decomposed. Rancid fat gives a disagreeable odor, due to the separation of the acid from its base.

6. The stearins are colorless and tasteless, but the oleins have a dark yellow color and a characteristic taste.

7. They are insoluble in water.

8. They are valuable in cooking, since they act as carriers for other materials.

Cookery of Fats.—Fats are considered more digestible uncooked than as hot cooked fats. The hot fat tends to penetrate the food mass and render it more difficult of digestion, while materials combined with uncooked fats are masticated and readily disintegrated. Fat that has been subjected to too intense a heat has undergone certain chemical changes, the products of which are irritating to the intestinal tract. Fats heated and resolidified are not as available food materials as before heating.

Digestion of Fats.—Fats are emulsified and saponified in the process of digestion. Emulsification is a physical change while saponification is a chemical one. An emulsion is a fine physical subdivision of fat particles held in suspension in some favorable medium. Milk is an example of emulsified fat. In emulsion fat is already partially digested and will be readily split into fatty acids and glycerin. Fats so split are readily absorbed or their fatty acids may combine with

the alkalis of the bile and the pancreatic juice to form soft soaps, which in turn serve to promote the emulsification of unemulsified fats in the bowel. Subsequent to their absorp-

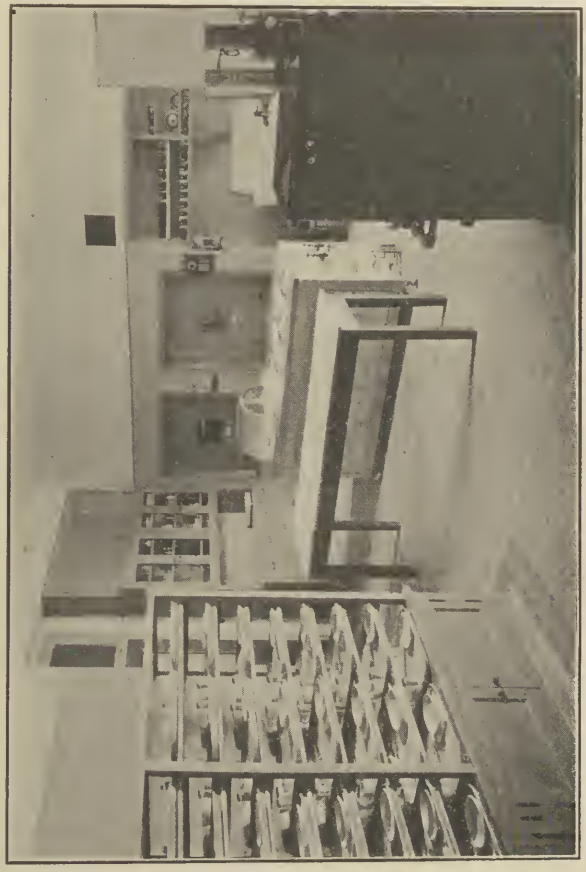

Fig. 1.—Diet kitchen.

tion the split fats are resynthesized. Cream or milk and butter, in combination with other foods, eggs and olive oil, are examples of desirable fats because they are easily digested.

Occurrence in the Body.—An average of one-fifth of the body weight is fat. Its storage, however, is not constant. The proteins are eliminated to the point of maintaining the nitrogenous equilibrium of the body. Carbohydrates are utilized only up to the carbohydrate limit of the individual; the mineral and the water content of the body remains fairly constant, but the utilization of fat varies. Adipose tissue is in the nature of a reserve fund drawn upon under starvation or illness. In excess it becomes a signal of danger. People of mature age and sedentary occupation should watch their weight and avoid the tendency to excessive increase.

Fat-soluble A Vitamin.—This is found in cream, milk, egg-yolk, in yellow corn and butter. It is believed to be an anti-rachitic vitamin. Such foods are especially important in the diet of children, since bone formation is a rapid and necessary process at this age. The fat-soluble vitamin seems to withstand heat.

Uses of Fat to the Body.—1. Fats that are not oxidized for energy production are stored chiefly in the connective tissues. The body is inclined to utilize its carbohydrate supply for its energy requirement and reserve its storage fat.

2. The organs of the body are frequently protected by layers of fat. These act as non-conductors of heat and therefore as a protection against cold.

3. Fats promote growth and certain fats aid the body in its utilization of the mineral supply in the construction of the hard parts of the body.

4. The fats with a low melting point are very completely utilized forms of food.

5. Fats are mild laxatives and lubricate the alimentary canal.

Dietetic Uses.—1. Fats are useful in the diet of children. They contain growth-promoting vitamins which are essen-

tial to their development. Children, on account of their great activity, require a high caloric diet and fats supply a concentrated food.

2. Diabetic patients are given a diet high in fat to satisfy the caloric requirement. The carbohydrates are restricted in this condition and the fats supply caloric values in their place.

3. In rickets and other deficiency diseases the fat soluble A containing foods are indicated.

4. In tuberculosis, anemia, during convalescence in wasting diseases and in visceral optoses, finely divided fats are given to force the feeding of the replacing tissues for those damaged by disease.

5. Fats are required by those exposed to severe cold or doing manual labor.

6. Certain oils are laxative and are given for this purpose.

7. Fats in excess cause gastritis and diarrhea.

8. Fats are restricted in disorders of the liver, as the bile is important in the digestion and absorption of fats.

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CHAPTER VII.

PROTEINS.

Source.—Proteins are built in the vegetable tissues; their nitrogens are derived from the soil or air. Proteins in the diet are secured from vegetable foods which have constructed their own protein or from animal food built up from the same vegetable proteins. Protein food comes from:

1. Animal Foods: meat, fish, fowl, eggs, milk and cheese.
2. Vegetable Foods: legumes (peas, beans, lentils), grains, and the rapidly growing part of the organism as buds or sprouts.

Composition.—Proteins are very complex and differ greatly in composition. They are difficult to study as living proteins, because they differ from the products they break into as soon as life leaves the body. The average protein is composed of carbon, hydrogen, nitrogen, oxygen, sulphur and traces, sometimes of phosphorus and iron.

Description.—In the living organism, proteins are in liquid or semisolid form. Under certain conditions products of protein metabolism are imperfectly eliminated and accumulate in the body. For example, urea and creatin in nephritis and uric acid in gout.

Classification of Proteins.—A classification of proteins adopted by the American Society of Biological Chemists is as follows:

1. *Simple proteins.*
   - (*a*) Albumins: in egg white, milk, blood.
   - (*b*) Globulins: myosin, fibrinogen, fibrin.
   - (*c*) Glutelins: gluten, avenin.

(*d*) Protamins: gliadin, zein.

(*e*) Albuminoids: keratin, collagen, elastin.

(*f*) Histones: globin of hemoglobin.

2. *Conjugated proteins* are proteins linked with some non-protein substance.

(*a*) Glyco-proteins: mucin and mucoids.

(*b*) Phospho-proteins: casein and vitellin.

(*c*) Chromo-proteins: hemoglobin (blood).

(*d*) Nucleo-proteins: nuclei of cells.

(*e*) Lecitho-proteins: vitellin.

3. *Derived Proteins.*—These are formed from other proteins, physiologically by ferment action, involving a cleavage of their molecular form.

(*a*) Meta-proteins.

(*b*) Proteoses.

(*c*) Peptones.

(*d*) Peptids.

(*e*) Amino-acids.

Test for Proteins.—To egg albumen add concentrated nitric acid and warm. A yellow precipitate results.

Characteristics.—1. Simple proteins are soluble in cold water or cold salt water.

2. Gelatins absorb cold water and are dissolved by hot water.

3. Hot water coagulates simple proteins.

4. Dry heat coagulates proteins.

Proteins are rendered relatively indigestible by coagulation under heat. They take on a tough, tenacious quality and become mechanically difficult unless reduced to powder. It is true that in the preparation of meat the outside surface is exposed to intense heat for a short time, but the heat is then rapidly reduced. This sacrifices the outside surfaces, but serves to retain the juices which, being converted into

steam, render the meat more tender. The general rule for the cooking of proteins calls for a moderate temperature.

Putrefaction.—Proteins are susceptible to bacterial action. This is a form of decomposition and very dangerous products may result. Protein foods must be carefully watched for indications of decomposition.

Uses in the Body.—1. To build and repair tissues which contain nitrogen.

2. To build up and store (transitorily) nitrogenous material.

3. To supply the protein constituents of body fluids, including blood and lymph.

4. To produce energy under emergency, involving an exhaustion of carbohydrates or fat storage.

Dietetic Uses.—1. To repair tissue waste in destructive diseases, as tuberculosis.

2. To repair the tissues in convalescence from continued or acute disease.

Precautions.—1. An excess of protein food may cause digestive disturbances. Proteins of choice in invalid-feeding are those of milk and eggs, as they do not contain stimulating extractives and are in easily digested form.

2. Proteins are restricted in acute kidney conditions, when the products of protein metabolism fail, more or less, of elimination.

3. In hypertension the diet in protein is kept low, barely maintaining a nitrogenous equilibrium. The purins are restricted.

4. In skin and asthma cases, skin tests may be used to determine protein sensitization. Offending proteins may be eliminated from the diet and avoided as a protection against future attacks.

The Digestion of Proteins.—The changes in digestion are both physical and chemical and are somewhat influenced by

the method of cooking to which the food has been subjected. Mastication is important in breaking up the food mass, so that the digestive juices may more thoroughly penetrate it. It serves, also, to break up the connective tissue.

Chemical Digestion of Protein.—Protein food passing into the stomach is penetrated by the gastric juice. Gastric digestion does not begin until the food has been neutralized by the hydrochloric acid of the secretion. The enzyme pepsin splits protein to proteoses and peptones, intermediate products of protein digestion. Trypsin, a much stronger ferment of the pancreatic juice, carries the digestion of proteins to completion in the small intestine. It splits proteins into proteoses, peptones, if not already so converted, and splits these into polypeptids and amino-acids. Erepsin, in the intestinal juice, assists the digestion by also converting the peptones and polypeptids into amino-acids.

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CHAPTER VIII.

THE CALORIC VALUES OF FOOD.

Factors Which Control the Food Requirement.—There are several factors which determine the food requirement of the body. The quantity of food necessary to maintain nutrition is influenced by age, sex, occupation, climate, weight and the extent of body surface.

Functional activity involves the expenditure of energy. Certain forms of function are constant or continuous, as digestion, respiration, circulation and the various changes of metabolism. The energy to produce all forms of work is supplied by the food. Foods are defined as substances, which when taken into the body build and repair tissue and supply the body with energy. The conversion of food into tissue involves a series of chemical changes which liberate heat. The fuel value of food is calculated in calories. A calorie is the amount of heat required to raise the temperature of 1 kilogram of water to 1° Centigrade.

Caloric Value of Food.—To determine the caloric value of food, multiply its fat, carbohydrate and protein content, converted into grams, by the number of calories yielded by each gram.

1 gram of protein yields four major calories.

1 gram of carbohydrate yields four major calories.

1 gram of fat yields nine major calories.

A kilogram is 1000 grams and equals 2.2 pounds. For practical purposes, consider 30 grams equal to 1 ounce.

Example:

Food.	Amount.	Protein.	Fat.	Carbohydrate.	Caloric value.
Butter . .	30 gm.	1.0%	85.0%	0%	
		0.3 gm.	25.5 gm.		
		×4	×9		
		1.2	229.5		230.7

Another method which may be used is: divide the caloric value per pound by 16, obtaining the caloric value per ounce; dividing this again by 30 to obtain the caloric value per gram.

Example:

Butter	3605.0	calories per pound.
	225.0	" " ounce.
	7.5	" " gram.

Weight.—Age, weight and height are considered together. Weight is the index to the condition of the body and the food requirement is indicated by its loss or increase. A table giving the number of calories allowed for each kilogram of body weight is as follows:

1 to 6 months	100
6 to 12 "	85
1 year	70
2 years	70+–65
3 to 7 years	65
7 to 12 "	60
12 years to maturity:	
(*a*) Period of structural activity	50
(*b*) Period of functional activity:	
For female	55
For male	60
(*c*) Maturity	37–55
(*d*) Old age	35–40

In old age the body needs more fuel in proportion to its weight than at maturity.

An estimate, indicating the varying daily caloric require-

ments according to the amount and form of functional activity, as computed by Tigerstedt,[1] is:

2001 to 2400 calories (shoemaker).
2401 to 2700 calories (weaver).
2701 to 3200 calories (carpenter).
3201 to 4100 calories (farm laborer).
4101 to 5000 calories (excavator).
5000 calories (lumberman).

Climate.—Climate has much to do with both the quality and the quantity of the food required. It is a recognized physiological fact that the digestion is less robust in spring than during the winter months. With the passing of the cold weather there is a relative lack of interest in food. This should be met by a radical change of diet. The spring diet should be lighter and easier of digestion and should contain green vegetables and fresh fruits. These foods contain valuable minerals. As the mild weather approaches the body has less need of the fuel foods, which make it possible to decrease the amount of fats and heavy carbohydrates.

In warm climates especially water is an important food. Because of the rapid evaporation of moisture from the skin, it is necessary to meet the loss with a large supply of fluid food. In these climates are found the succulent fruits and vegetables, which consist largely of water, Nature seemingly adapting the food produced by the locality to the needs of its people.

In the temperature zone the people do more active work than the less robust people of the south, and here, consequently, are used the more nutritious fruits. These carbohydrate foods are the most active. They do not represent

[1] Excerpt from a Text-book of Human Physiology, translated by John Murlin, M.D., p. 141 (courtesy of D. Appleton & Co.).

however, the largest energy producers, as the fats represent, weight for weight, more than twice the amount of heat that the proteins and carbohydrates contribute.

The value of fats as heat producers has been established. Arctic travelers carry a supply of chocolate which, aside from the fact that it does not freeze and does not require cooking, contains a large supply of fat.

Age.—During the early years of life the demand for food is high because of the rapidity of growth. A child under two years of age requires proportionately twice the amount of food that the adult needs. The food requirement is relatively high during childhood, gradually decreasing according to the rate of growth.

Atwater states that a child under two years requires three-tenths the food of an adult man at active muscular work; that a child of two to five years requires four-tenths the food of an adult man at active muscular work; that a child of six to nine requires one-half the food of an adult man at active muscular work; that a boy ten to eleven or a girl ten to twelve requires six-tenths the food of a man at active muscular work; that a woman at light work, a boy of twelve or a girl of thirteen to fourteen requires seven-tenths the food of a man at moderately active muscular work; that a man at light muscular work or a boy fifteen to sixteen years old requires nine-tenths the food of a man at moderately active muscular work, and that a man at hard muscular work requires one-fifth more food than a man at moderately active work.

Sex.—Caloric need is influenced by the amount of body surface, the tall individual losing more heat through radiation than the short, heavy one of the same weight. Women lose proportionately to weight and size more heat by radia-

tion than do men; and also because their body processes are more rapid than those of men. Although women require eight-tenths the amount of food that men require, yet, weight for weight, their demand for food is greater. No one factor can control the caloric requirement of the individual, but weight, sex, occupation, build, age and climate must all be considered in providing an adequate diet.

AN ADEQUATE MENU FOR ONE DAY.

(Man, aged thirty years; weight, 160 pounds; occupation, office man; required number of calories per day, 2920; 40 calories per 1 kg.)

Food.	Grams.	Protein, grams.	Fat, grams.	Carbohydrate, grams.
Breakfast.				
Orange	150	1.2	0.3	17.4
Cream of Wheat	45	4.995	0.765	33.975
Toast	30	3.45	0.48	18.36
Butter	15	0.15	12.75	
Cream	60	1.5	11.1	2.7
Sugar	30	...	...	30.0
Coffee				
Total grams	...	11.295	25.395	102.435
		×4	×9	×4
Total calories	...	45.180	228.555	409.740
Dinner.				
Roast beef	60	13.38	17.16	
Baked potatoes	90	7.65	0.36	72.81
String beans	60	0.48	0.66	1.14
Rye bread	60	5.4	0.36	31.92
Cottage pudding	100	6.3	4.6	56.9
Lemon sauce	25	...	...	14.4
Butter	15	0.15	12.75	
Cream	15	0.37	2.77	0.675
Sugar	10	...	...	0.10
Coffee				
Total grams	...	33.730	38.660	177.945
		×4	×9	×4
Total calories	...	134.920	347.940	711.780

Supper.

Cold meat	60	13.38	17.16	
Soup	150	2.7	1.65	8.4
Crackers	40	3.92	3.65	29.24
Baked rice	45	3.6	1.35	35.55
Baked apple	120	0.48	0.6	17.04
Bread	60	5.58	0.73	31.62
Butter	15	0.15	12.75	
Cream	10	0.03	1.45	2.7
Sugar	20	...	...	20.0
Coffee				
Total grams		29.840	39.330	144.550
		×4	×9	×4
Total calories		119.360	353.970	578.200

Grand Totals.

Number of calories of protein	299.47
Number of calories of fat	930.46
Number of calories of carbohydrate	1699.72
Total number of calories per day	2929.65

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CHAPTER IX.

WEIGHTS OF RATIONS OF FOODS—TABLE OF CALORIC VALUES.

100-GRAM PORTIONS OF FOODS.

Food.	Approximate measurement.	Calories.
Apples	1 small	60
Apricots	5	55
Asparagus	4 tablespoonfuls	13
Bacon	5 slices 6 inches long	434
Butter	7 tablespoonfuls	751
Buttermilk	½ glass	34
Bread, white	3 slices	255
Bread, whole wheat	2½ slices	240
Beets	4 tablespoonfuls	45
Chicken	2 slices	105
Cream	8 tablespoonfuls	190
Cream cheese	3 inches 1¾ x 1 inch	406
Cake, plain	3 x 3 x 2 inches	285
Crackers, soda	12	400
Cabbage	¼ medium head	30
Celery	5 stalks 4 inches long	18
Corn	6 tablespoonfuls	95
Cucumbers	½ medium	17
Cornmeal	12 tablespoonfuls	360
Cocoa	10 tablespoonfuls	485
Chocolate	3⅓ squares	595
Dates	13	335
Eggs	2 small	150
Figs	6	80
Flour, white	15 tablespoonfuls	340
Grapes	1 bunch	100
Halibut	1 serving	120
Ham	3 slices	275
Honey	3 tablespoonfuls	315
Lemons	1	40
Lettuce	10 leaves	20
Lamb, leg	2 slices	220
Lamb chops	1 chop	320
Macaroni	90 pieces 4 inches long	345
Mushrooms	¼ cut	45
Milk	½ glass	70
Oatmeal, uncooked	16 tablespoonfuls	385
Orange	⅔ medium orange	50

Food.	Approximate measurement.	Calories.
Onion	1	50
Oysters	9	70
Pecans	140 halves	86
Potatoes	¾	80
Peas, green	5 tablespoonfuls	95
Parsnips	1	60
Pears	1	60
Raisins	120	335
Rice	7 tablespoonfuls	340
Round steak	1 serving	175
Sirloin steak	1 serving	230
Starch, corn	13 tablespoonfuls	350
Spinach	4 tablespoonfuls	35
String beans	3 tablespoonfuls	40
Sugar	8 tablespoonfuls	390
Squash	2½ tablespoonfuls, heaping	45
Tomatoes	4 tablespoonfuls	25
Turnips	6 tablespoonfuls	40
Tapioca, uncooked	9 tablespoonfuls	345
Walnuts	35 halves	726
Olive oil	6 tablespoonfuls	900

100-CALORIE PORTIONS OF FOODS.

Food.	Weight, grams.	Approximate measurements.
Apples	166	1 large
Apricots	170	8 large
Asparagus	450	17 large
Bacon	20	2 strips 4 inches long
Butter	13	1 tablespoonful
Buttermilk	280	1½ glass
Bread, white	33	1 slice
Bread, whole wheat	40	1 slice
Beets	225	10 tablespoonfuls
Chicken	50	2 small slices
Cream	50	4 tablespoonfuls
Cream cheese	25	1 x ½ x 3 inches
Cake	25	1 x 2 x 2 inches
Crackers, soda	25	3
Cabbage	320	1 medium head
Celery	500	25 stalks 4½ x 1½ inches
Corn	100	6 tablespoonfuls
Cucumbers	575	3 small
Cornmeal, uncooked	28	3 tablespoonfuls
Cocoa	20	2 tablespoonfuls
Chocolate	16	⅓ square
Dates	30	4
Eggs	65	1 large
Figs	32	2
Flour, white	28	4 tablespoonfuls level
Grapes	100	1 bunch

Food.	Weight, grams.	Approximate measurements.
Halibut	75	3½ x 2½ x 1½ inches
Ham	35	1 slice
Honey	35	4 teaspoonfuls
Lemons	230	2 large
Lettuce	500	50 leaves
Lamb, leg	45	1 slice
Lamb chops	28	E. P. of 1 small rib chop
Macaroni	28	25 pieces 4 inches long
Mushrooms	220	2½ cups
Milk	145	¾ glass
Oatmeal, uncooked	25	4 tablespoonfuls
Olive oil	11	2 teaspoonfuls
Orange	200	1 to ½
Onion	205	2
Oysters	175	14
Pecans	25	35 halves
Potatoes	120	1
Peas	100	4 tablespoonfuls
Parsnips	150	6 tablespoonfuls
Pears	160	1½
Raisins	30	36
Rice, uncooked	208	2 tablespoonfuls
Round steak	50	1½ x 2 x 1 inch
Sirloin steak	35	1½ x 2 x 1 inch
Starch (corn)	30	4 tablespoonfuls
Spinach, fresh	415	18 tablespoonfuls
String beans, fresh	245	8 tablespoonfuls
Sugar	25	2 tablespoonfuls
Squash	225	5 tablespoonfuls
Tomatoes	440	12 tablespoonfuls
Turnips	250	15 tablespoonfuls
Tapioca, uncooked	29	3 tablespoonfuls
Walnuts	15	5 halves

Caloric Values of Food.[1]

Food.	Water, per cent.	Protein, per cent.	Fats, per cent.	Carbohydrates, per cent.	Ash. per cent.	Food value, per pound.
Breads.						
Corn bread	38.9	7.9	4.7	46.3	2.2	1205
Rye bread	35.7	9.0	0.6	53.2	1.5	1180
Graham bread	35.7	8.9	1.8	52.1	1.5	1210
White bread	35.0	9.1	1.6	53.3	1.0	1225
Whole wheat bread	38.4	9.7	0.9	49.7	1.3	1140
Graham crackers	5.4	10.0	9.4	73.8	1.4	1955
Oatmeal crackers	6.3	11.8	11.1	69.0	1.8	1970
Oyster crackers	4.8	11.3	10.5	70.5	2.9	1965
Soda crackers	5.9	9.8	9.1	73.1	2.1	1925
Sugars, etc.						
Granulated sugar	..	..	..	100.0	..	1860
Brown sugar	..	..	..	95.0	..	1765
Maple sugar	..	..	..	82.8	..	1540
Maple syrup	..	..	..	71.4	..	1330
Cereals.						
Barley, pearl	11.5	8.5	1.1	77.8	1.1	1650
Cornmeal	11.6	8.4	4.7	74.0	1.3	1730
Hominy	11.8	8.3	0.6	79.0	0.3	1650
Oatmeal	7.3	16.1	7.2	67.5	1.0	1860
Oats, rolled	7.7	16.7	7.3	66.2	2.1	1850
Rice	12.3	8.0	0.3	79.0	0.4	1630
Macaroni	10.3	13.4	0.9	74.1	1.3	1665
Wheat meal	10.1	11.1	1.7	75.5	1.6	1685
Flour.						
Barley	11.9	10.5	2.2	72.8	2.6	1640
Buckwheat	13.6	6.4	1.2	77.9	0.9	1620
Whole wheat flour	11.4	13.8	1.9	71.9	1.0	1675
Graham flour	11.3	13.3	2.2	771.4	1.8	1670
Patent wheat flour	12.8	10.8	1.1	74.8	0.5	1640
Rye flour	12.9	6.8	0.9	78.7	0.7	1630
Vegetables (Green).						
Asparagus	94.0	1.8	0.2	3.3	0.7	105
Beans, Lima	30.8	3.2	0.3	9.9	0.8	255
Beans, dried	10.4	18.1	1.5	65.9	4.1	1625
Beans, butter	29.4	4.7	0.3	14.6	1.0	370
Beans, butter, dried	12.6	22.5	1.8	59.6	3.5	1605
Beans, string	89.2	2.3	0.3	7.4	0.8	195
Cabbage	91.5	1.6	0.3	5.6	1.0	145
Cauliflower	92.3	1.8	0.5	4.7	0.7	140
Celery	94.5	1.1	0.1	3.3	1.0	85
Corn, green	75.4	3.1	1.1	19.7	0.7	470
Cucumbers	95.4	0.8	0.2	3.1	0.5	80

[1] Bulletin No. 28, U. S, Department of Agriculture.

Food.	Water, per cent.	Protein, per cent.	Fats, per cent.	Carbohydrates, per cent.	Ash. per cent.	Food value, per pound.
Vegetables (Green).						
Eggplant	92.9	1.2	0.3	5.1	0.5	130
Greens, beet	89.5	2.2	3.4	3.2	1.7	245
Lettuce	94.7	1.2	0.3	2.9	0.9	90
Onions, green	87.1	1.0	0.1	11.2	0.6	230
Peas, green	74.6	7.0	0.5	16.9	1.0	465
Peas, dried	9.5	24.6	1.0	62.0	2.9	1655
Rhubarb	94.4	0.6	0.7	3.6	0.7	105
Spinach	92.3	2.1	0.3	3.2	2.1	110
Tomatoes	94.3	0.9	0.4	3.9	0.5	105
Mushrooms	88.1	3.5	0.4	6.8	1.2	210
Fruit.						
Apples	84.6	0.4	0.5	14.2	0.3	290
Apricots	85.0	1.1	..	13.4	0.5	270
Bananas	75.3	1.3	0.6	22.0	0.8	460
Blackberries	86.3	1.3	1.0	10.9	0.5	270
Cherries	80.9	1.0	0.8	16.7	0.6	365
Cranberries	88.9	0.4	0.6	9.9	0.2	215
Figs	79.1	1.5	..	18.8	0.6	380
Grapes	77.4	1.3	1.6	19.2	0.5	450
Lemons	89.3	1.0	0.7	8.5	0.5	205
Muskmelons	89.5	0.6	..	9.3	0.6	185
Oranges	86.9	0.8	0.2	11.6	0.5	240
Pears	84.4	0.6	0.5	14.1	0.4	295
Pineapple	89.3	0.4	0.3	9.7	0.3	200
Plums	78.4	1.0	..	20.1	0.5	395
Prunes	79.6	0.9	..	18.9	0.6	370
Raspberries	84.1	1.7	1.0	12.6	0.6	310
Strawberries	90.4	1.0	0.6	7.4	0.6	180
Watermelons	92.4	0.4	0.2	6.7	0.3	140
Nuts.						
Almonds	4.8	21.0	54.9	17.3	2.0	3030
Brazil nuts	5.3	17.0	66.8	7.0	3.9	3265
Butternuts	4.4	27.9	61.2	3.5	2.9	3165
Cocoanuts	14.1	5.7	50.6	27.9	1.7	2760
Filberts	3.7	15.6	65.3	13.0	2.4	3290
Hickory nuts	3.7	15.4	67.4	11.4	2.1	3345
Pecans	3.0	11.0	71.2	13.3	1.5	3455
Walnuts	2.5	16.6	63.4	16.1	1.4	3285
Chestnuts	45.0	6.2	5.4	42.1	1.3	1125
Peanuts	9.2	25.8	38.6	24.4	2.0	2560
Vegetables and Roots.						
Artichokes	79.5	2.6	0.2	16.7	1.1	365
Beets	87.5	1.6	0.1	9.7	1.1	215
Carrots	88.2	1.1	0.4	9.3	1.0	210
Onions	87.6	1.6	0.3	9.9	0.6	225
Parsnips	83.0	1.6	0.5	13.5	1.4	300
Potatoes	78.3	2.2	0.1	18.4	1.0	385
Potatoes, sweet	69.0	1.8	0.7	27.4	1.1	570
Radishes	91.8	1.3	0.1	5.8	1.0	135
Turnips	89.6	1.3	0.2	8.1	0.8	185

Dairy Products.

N. × 6.25

Food.	Water, per cent.	Protein, per cent.	Fats, per cent.	Carbohydrates, per cent.	Ash. per cent.	Food value, per pound.
Eggs	73.7	13.4	10.5	..	1.0	720
Egg white	86.2	12.3	0.2	..	0.6	250
Egg yolk	49.5	15.7	33.3	..	1.1	1705
Cow's milk	87.0	3.3	4.0	5.0	0.7	325
Cream	74.0	2.5	18.5	4.5	0.5	910
Butter	11.0	1.0	85.0	..	3.0	3605
Cheese, cottage	72.0	20.9	1.0	4.3	1.8	510
Cheese, cream	34.2	25.9	33.7	2.4	3.8	1950
Buttermilk	91.0	3.0	0.5	4.8	0.7	165

Meats.

Beef loin	60.6	18.5	20.2	..	1.0	1190
Veal, leg	70.0	20.2	9.0	..	1.2	755
Mutton, loin	43.3	14.7	41.7	..	0.8	2035
Lamb, loin	53.1	18.7	28.3	..	1.0	1540
Pork, loin	41.8	13.4	24.2	..	0.8	1270

Poultry.

Chicken	74.8	21.5	2.5	..	1.1	505
Fowl	63.7	19.3	16.3	..	1.0	1045
Goose	46.7	16.3	36.2	..	0.8	1830
Turkey	55.5	21.1	22.9	..	1.0	1360
Duck	59.9	27.0	11.5	..	1.3	985

Fish.

Bass	76.7	20.6	1.7	..	1.2	455
Cod	82.6	16.5	0.4	..	1.2	325
Eels	71.6	18.6	9.1	..	1.0	730
Flounder	84.2	14.2	0.6	..	1.3	290
Haddock	81.7	17.2	0.3	..	1.2	335
Halibut	75.4	18.6	5.2	..	1.0	565
Herring	72.5	19.5	7.1	..	1.5	660
Perch	75.7	19.3	4.0	..	1.2	530
Mackerel	73.4	18.7	7.1	..	1.2	645
Pickerel	79.8	18.7	0.5	..	1.1	370
Pike	80.8	17.9	0.8	..	1.1	365
Salmon	64.6	22.0	12.8	..	1.4	950
Trout	70.8	17.8	10.3	..	1.2	765
Whitefish	69.8	22.9	6.5	..	1.6	700

Shell Fish.

Lobster	77.8	18.1	1.1	0.5	2.5	390
Oysters	83.4	8.8	2.4	3.9	1.5	335
Clams	84.5	9.0	1.3	2.9	2.3	275
Crabs	80.0	15.8	1.5	0.7	2.0	370

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CHAPTER X.

FOOD PREPARATION.

Principles of Cookery.—There are two sides to the food problem, the scientific side and the artistic side. These should be solved hand-in-hand to secure the most desirable results. To have a scientific knowledge of cooking we must understand:

1. The composition of food materials and their uses in the body.

2. The general principle of cooking applicable to each class of foods, so that we know what kind of heat to apply, how much and for how long a time.

3. The best methods of keeping foods from decomposing and of detecting decomposition when it has already set in.

4. The economical use of cooking utensils, fuel, etc., so that time and money may be saved.

5. The proper proportions of food materials used in any given recipe.

Reasons for Cooking.—1. That food may be rendered more digestible.

2. That harmful bacteria may be destroyed.

3. That fiber in vegetable foods and connective tissue in animal foods may be softened and broken down.

4. That food may be made more attractive.

5. That flavor be developed.

Esthetic Values of Food.—The esthetic values of food are enhanced:

1. By the development of flavor in food.

2. By the appropriate service of food.

3. By a suitable color scheme.
4. By the aid of decoration.

The esthetic value of food may be enhanced or impaired in the cooking process. This applies to all cookery, but it must be emphasized in the preparation of food for the sick, in whom appetite is variable and for whom every effort must be made to make food service attractive.

Selection of Food.—Fresh fruit and vegetables lend variety and are nicely decorative. Salads give a note of color and desserts may be so served as to be ornamental.

Food Measurements—Thermometry—Abbreviations.

Table of Liquid Measures.

60 minims	=	1 fluidram
8 fluidrams	=	1 fluidounce
16 fluidounces	=	1 pint
2 pints	=	1 quart
4 quarts	=	1 gallon

Household Measures.

60 drops	=	1 teaspoonful
3 teaspoonfuls	=	1 tablespoonful
2 tablespoonfuls	=	1 fluidounce
8 fluidounces	=	1 cup
16 fluidounces	=	1 pint

Approximate Metric Equivalents.

1 fluidram	=	4 cubic centimeters (cc)
1 dram	=	4 grams (gms.)
1 fluidounce	=	30 cubic centimeters
1 ounce	=	28 grams
1 quart	=	1 liter

Culinary Measures.

3 teaspoonfuls	=	1 tablespoonful
16 tablespoonfuls (dry material)	=	1 cup
2 cups	=	1 pint
4 cups flour	=	1 pound
2 cups sugar (granulated)	=	1 pound
2 cups butter (packed solid)	=	1 pound
2 tablespoonfuls butter	=	1 ounce
2 tablespoonfuls sugar	=	1 ounce
2 tablespoonfuls liquid	=	1 ounce

Thermometry.—

Kinds of Thermometers.

1. Fahrenheit is used in cookery in regulating the temperature of a room or in taking body temperature. The freezing point is 32° above zero. The boiling point is 212°.

2. Centigrade is used by most scientists. The freezing point is zero. The boiling point is 100°.

To Change from One Scale to Another.

Above 0° C. or 32° F.

F. to C. Subtract 32, multiply by 5, divide by 9.

Example:

Change 212° F. to C.

$212° - 32° = 180°$ $\quad 180° \times \frac{5}{9} = 100°$ C.

C. to F. Multiply by 9, divide by 5, add 32.

Change 100° C. to F.

$100° \times \frac{9}{5} = 180°$ $\quad 180° + 32° = 212°$ F.

Between 0° and 32° F. and 17.75° and 0° C.

F. to C. Subtract from 32, multiply by 5, divide by 9.

C. to F. Multiply by 9, divide by 5, subtract from 32.

Rules for Measuring.—1. All measurements are to be made level unless otherwise directed in the recipe.

2. In measuring solid materials with a teaspoon, tablespoon or standard measuring cup, fill the measuring utensil with the material and then level off with a knife.

3. Half a spoonful is obtained by dividing a level spoonful lengthwise through the center.

4. A quarter of a spoonful is obtained by dividing a half spoonful through the center crosswise.

5. An eighth of a spoonful is obtained by dividing a quarter spoonful diagonally.

6. A third of a spoonful is obtained by dividing a level spoonful twice crosswise.

Care of the Laboratory.—*Routine Methods of Cleaning Gas Stoves.*—Ordinary brown wrapping paper, newspaper or tissue paper, cut in squares 6″ x 6″, can be used to remove the deposit made by water spilled on the stove.

Kitchen Utensils.—Kitchen utensils may be kept in good condition with the liberal use of hot water, soap and ammonia or washing-soda solution (hot water 1 gallon and sal soda 1 pound). Sapolio may be used when substances are burned on or when the utensil is smoked. Soda solution also removes burnt substances. In cooking cocoa or milk, if utensils are well rinsed with cold water first the coating is easier removed.

Iron Rust.—To remove iron rust from iron or steel, scrub with sweet oil and emery powder; coat with sweet oil and allow it to stand twenty-four hours.

To Remove Grease from Unpainted Wood.—Apply soda dissolved in cold water. Wash off with hot water. Apply soap powders.

To Remove White Spots from Polished Wood.—Sponge off with spirits of camphor; follow by rubbing with oil and turpentine.

To Remove Ink Stains from Wood.—Apply some absorbent starch, blotting paper, etc. When no more ink is absorbed, rub spots with lemon pulp, javelle water or common salt. Wash off with cold or tepid water.

Painted, Varnished and Oiled Woodwork.—Clean with weak solution of ammonia. Three per cent solution: 30 cc (2 tablespoonfuls) ammonia 1000 cc (1 quart) water.

Wash a small surface at a time and wipe dry with cloth. White paint should be cleaned with whiting applied with moistened cloth or sponge. Clean a small surface at a time and wipe dry immediately.

Porcelain.—Remove grease and dirt with kerosene; remove kerosene with hot water and soap. Iron stains may be removed from porcelain by rubbing the spot with a 10 per cent solution of hydrochloric acid, removing the acid with sodium carbonate (washing soda), 5 per cent solution.

3 tablespoonfuls soda (=50 gms.)
1 quart water (=1000 cc)

Glass Windows, etc.—Wash with kerosene and water (1 tablespoonful kerosene to 1 quart water); or cover glass with coating of whiting or Bon Ami, allow to dry and then wipe off and polish.

Nickel.—Nickel may be kept bright by frequent washing with hot water and soap. It may occasionally be rubbed with sodium bicarbonate and kerosene made into a paste.

Copper and Brass.—Use formula: kerosene, 1 pint; whiting 4 ounces; oxalic acid, 2 teaspoonfuls; alcohol, 4 ounces. This preparation is very efficient.

Rules for Washing Dishes.—1. Collect all dishes to be washed, scrape them clean, wipe off grease with soft paper and pile dishes of a kind together.

2. Soak dishes that have held eggs, milk or starchy materials in cold water. Those that have held sugar in hot water.

3. Have two pans of hot water, one for washing dishes and one for rinsing.

4. Have a clean place ready for dry dishes.

5. Be sure that your dish cloth is perfectly clean and have a separate one for china and for the kitchen utensils.

6. Dishes should be washed in the following order.

(*a*) Glass: wipe directly from soapy water to make them shine.

(*b*) Silver: same as glass.

(*c*) Fine china: rinse well and wipe.

(*d*) Heavier china: rinse well and wipe.

(*e*) Small kitchen utensils: knives and forks should be scoured with brick, sapolio or kitchen cleanser.

(*f*) Large kitchen utensils, rinse well; dry thoroughly before putting away.

7. Do not wet the cogs of egg beaters.

8. Wash tea and coffee pots carefully with clean, hot water; rinse well.

9. Change dish water when necessary during washing process.

10. Do not let soap soak in dish pan.

11. Wash dish pan thoroughly; wipe dry before putting away.

12. Rinse out dish towels and cloths and hang in the sun, if possible, after every washing.

Care of Sink.—1. A good porcelain sink with open plumbing is the easiest to keep clean.

2. Keep an enamel sink strainer in the sink and pass all waste material through it. After each meal when you clean the sink, empty strainer, wash well and wipe dry.

3. After every meal wash sink thoroughly with hot soapy water. Remove stains with Dutch Cleanser.

4. Once a week pour a strong solution of sal soda ($\frac{1}{2}$ cup soda to 2 quarts hot water) down the sink pipe. Flush with boiling water.

Care of the Refrigerator.—The refrigerator must be kept perfectly clean or it becomes a good breeding place for germs. The following points, if carefully followed, will ensure this perfect cleanliness:

1. Never put hot food or food with strong odors into the ice-box.

2. Keep perishable materials like butter, eggs and milk in the lower part of the box, as the current of air is toward the top. Keep foods with stronger flavors, if necessary on top shelves.

3. Put leftover foods away in the smallest utensils possible.

4. Watch carefully each day for any signs of decomposition in food and remove at once.

5. Keep the ice-box cold and at an even temperature. Do not let all the ice melt before box is replenished. This warms the box and requires a large quantity of ice to cool it.

6. If anything is spilled in the ice-box wipe it up at once.

7. Once a week remove contents of box; remove shelves and wash in hot soda or borax water; put shelves to dry in a warm place or in the sun. Wash inside of box carefully and dry well. Pour hot soda water down the trap and see that it is free from sawdust or any accumulation from the ice water.

8. If ice water appears in the bottom of your refrigerator your drain pipe is clogged up. Clean out the drain with a bottle brush or skewer, then flush with hot soda water as directed.

Care of the Garbage Can.—1. The garbage can should be kept as clean and inoffensive as possible.

2. Use a galvanized can with a tight-fitting cover.

3. Place garbage can outside if possible.

4. Empty garbage from the kitchen after each meal. Do not let it stand in kitchen even in winter. If there is no rule to the contrary in your locality, place the garbage in a clean paper before depositing it in the can.
5. The garbage can may be lined with clean newspaper. This makes it easier to keep clean.
6. All liquids must be strained from refuse before placing it in the can.
7. Once a week scald out the can with boiling water to which some disinfectant or deodorant has been added. Dry in the sun with cover off.

Duties of Housekeepers in Dietetic Classes.—1. Have general oversight of class cooking at the large range. Light the oven when required and turn it off when it is no longer needed.

2. Clean gas stove, if necessary, after class period.

3. Responsible for condition of laboratory sink. Keep it free from dishes during class period and distribute such dishes and utensils to members of the class for cleaning. Wash sink and drain board, polish faucets and leave this part of the room in perfect condition.

4. Keep supply table in order during and after class. Clear table when supplies are no longer needed and wash with hot water and soap.

5. Leave refrigerator in order. Sweep laboratory if necessary.

CHAPTER XI.

BEVERAGES.

Beverages as a class are valuable because of the water they contain. This is especially true during acute illness and during convalescence from acute illness, as the water helps to rid the body of the toxins resulting from infection; it tends toward the better digestion of food; and it provides for the restoration of fluid lost to the body in the course of the disease. Besides, each class of beverages has a particular function or functions to perform in the body. Beverages may be divided into four groups:

1. *Acid Beverages.*—Acid beverages, fruit juices combined with plain or carbonated water. These are not only refreshing, but they furnish valuable salts and tend to promote the alkalinity of the tissues. Example: orangeade.

2. *Stimulating Beverages.*—Stimulating beverages, relieving fatigue, warming the digestive tract and preparing it for the reception of solid food. They have no food value in themselves, but are usually accompanied by cream and sugar. Examples: tea, coffee, broth.

3. *Farinaceous Beverages.*—Farinaceous beverages, which furnish some values in the form of starch. They are cooked, thinned, strained cereals, served as gruels. They have a sedative effect on the walls of the alimentary canal and give variety to a limited diet. They may be diluted with cream and butter, giving them a higher caloric value. Example: oatmeal gruel.

4. *Albuminous Beverages.*—Albuminous beverages, these are high in food value and form a means of giving food in a

highly concentrated form. Those made with the entire egg are especially high in food value, while those made with the white alone are simpler and easier of digestion. Example: fruit albumin, eggnog.

RECIPES.

Lemonade.

1 lemon; 2 teaspoonfuls sugar; 1 cup boiling water.

Wash the lemon, roll until soft. Cut in two with a silver knife. Squeeze out the juice; add sugar and boiling water. Cover well and chill.

Pineappleade.

Add to recipe for lemonade:

½ cup of pineapple pulp; ½ cup boiling water; sugar to taste. Strain before serving.

Irish-moss Lemonade.

Pick over moss and soak in cold water to cover for half an hour. Remove from water, add 1 cup of cold water and cook in the top of a double boiler about twenty minutes. Add this to lemonade. Any other fruit drink may be treated in the same way.

Bran Water.

Soak ¼ cup of bran in 1 cup of cold water overnight and strain. Add to lemonade.

Vichy or Soda Water.

Stir ¼ teaspoonful Vichy powder or ½ teaspoonful soda into lemonade just before serving. Do not have the glass too full. Serve immediately. This has a slightly laxative effect.

Cooked Eggnog.

$1\frac{1}{2}$ cups of milk; 1 egg.

Heat the milk in a double boiler. Add the beaten egg. Stir until mixed and remove from fire. Season and chill. This serves to disguise the egg if the patient objects to the raw-egg flavor.

Eggnog.

1 egg; 2 teaspoonfuls of sugar; $\frac{3}{4}$ cup of milk; $\frac{1}{8}$ teaspoonful of lemon extract; few grains of salt.

Beat the egg until foamy; add sugar and milk and then flavoring extract.

Tea.

1 teaspoonful of tea; 1 cup of boiling water.

Scald teapot, which should be of silver, crockery or granite ware. Put in the tea; add boiling water and let it infuse for five minutes. Do not boil.

Tea, like coffee, contains tannin, a harmful astringent; thein, a stimulating property; and essential oils, which give it flavor. Boiling or too long steeping brings out the tannin, which is the undesirable thing.

Coffee.

2 tablespoonfuls of coffee; $\frac{1}{8}$ cup of cold water; $\frac{1}{4}$ egg; 1 cup of boiling water.

Scald the coffee-pot. Wash the egg, break and beat slightly; dilute $\frac{1}{4}$ egg with 2 tablespoonfuls of cold water and mix with the coffee. Add the boiling water and stir. Boil three minutes. Let it stand over low flame for ten minutes. Add 1 tablespoonful of cold water. Serve.

Coffee contains a stimulating property, caffein; a harmful tannin, which is bitter to taste and retards the flow of the

digestive juices; and essential oils, which give each kind of coffee its characteristic flavor.

Breakfast Cocoa.

1 pint of scalded milk; 3 tablespoonfuls of cocoa; ½ cup of boiling water; 2 tablespoonfuls of sugar.

Mix the cocoa and sugar in a saucepan. Stir in the water gradually and boil for five minutes. Add the milk and cook for five minutes, or until smooth, in a double boiler. Beat well with a Dover beater.

Chocolate.

½ square Baker's chocolate; 1 cup of milk;
½ tablespoonful of sugar; ¼ cup of boiling water; salt.

Scald the milk. Melt chocolate in a small sauce-pan placed over hot water. Add sugar, salt and gradually boiling water; when smooth, place on the range and boil for one minute. Add to the scalded milk; beat with Dover egg beater and serve in chocolate cups with whipped cream.

The cocoa seeds or beans are enclosed in a pod, each pod containing from twenty to forty beans. These beans are fermented for several days to develop their flavor, then dried and roasted and finally ground fine. In making cocoa some of the fat of the bean is removed after grinding. In the making of chocolate, it is put up in the raw or bitter form or is flavored and sweetened before running it into the molds. Both have a slightly stimulating effect, because of a mild principle, theobromin, similar to caffein, which they contain.

Barley Water.

1½ teaspoonfuls of pearl barley; 2 cups of cold water.

Soak the barley in cold water overnight. Drain and add

fresh water. Boil in the water until quantity is reduced to two-thirds of a cup. Strain, serve hot or cold or use to dilute other gruels. This may be seasoned with salt, fruit juice or wine.

Arrowroot Gruel.

Dissolve ¼ teaspoonful of sugar and ¼ teaspoonful of salt in a cupful of water. Mix ½ tablespoonful of arrowroot flour with a little cold water and combine with mixture. Boil for twenty minutes, stirring constantly; then add a cupful of milk, bring to the boiling point, strain and serve hot.

Oatmeal Gruel.

¼ cup of oatmeal; 2 cups of water; ⅛ teaspoonful of salt.

Boil directly over the fire for thirty minutes. This will probably cook down to one-half. Strain; add 1 cup of milk, re-heat and serve in a china cup. Gruel is colorless and needs a gaily colored cup.

Flour Gruel.

Proceed as in making arrowroot gruel, using instead a tablespoonful of wheat flour. Flavor with lemon juice, cinnamon, nutmeg or vanilla.

Farina Gruel.

Proceed as above, using instead a tablespoonful of farina, and boil for about ten minutes before adding milk.

Cracker Gruel.

Use 2 tablespoonfuls of cracker crumbs and proceed as above. Cook only two or three minutes and do not strain.

Chocolate Shake.

Combine ½ cup of cocoa and 2 cups of water. Boil for twenty minutes. Add 1 cup of sugar and boil for five minutes. Add ½ teaspoonful of vanilla and chill. For a chocolate shake, put 2 tablespoonfuls of syrup, 1 egg, ½ cup of milk and ¼ cup of crushed ice in a Mason jar. Instead of the crushed ice, 2 tablespoonfuls of ice-cream may be used. Shake well, strain and serve cold. Salt crackers may be served with the beverage.

In some cases it is well not to serve so heavy a beverage, and then only the white of the egg may be used.

Fruit Albumin.

Combine the juice of ½ an orange; ½ a lemon; ½ teaspoonful of sugar; white of 1 egg; ½ cup of chopped ice.

Shake in a covered jar. Serve very cold.

Albuminized Tea.

Rinse out teapot with boiling water. Put in tea, pour on boiling water. Let stand in a warm place for five minutes. Pour off the liquid, add 1 egg white to each cup of liquid. Chill liquid before adding egg white. Albuminized drinks are used chiefly in cases of acute stomach and intestinal disorder. They are nutritious and easily assimilated. For infants, use 1 egg white to 1 quart of chilled boiled water.

Fruit Punch.

2 cups of water; chopped rind of lemon; 1 dozen strawberries; 2 quarts Apollinaris; 2 cups of sugar; juice of 8 lemons; 1 can of pineapple; ¼ pound of candied cherries.

Boil the water, sugar and lemon rind for ten minutes.

Strain, cool, add lemon juice and chopped pineapple. Place a large square of ice in punch bowl. Pour mixture over it. Add Apollinaris water last.

Fruit Punch.

4 cups of cold water; 2 cups of chopped pineapple; ½ cup of lemon juice; 2 cups of sugar; 1 cup of orange juice.

Boil water, sugar and pineapple for twenty minutes. Add the fruit juice, cool, strain and dilute with ice water. Any of the following may be used:

½ box strawberries or raspberries, mashed.
1 cup of cherries.
½ cup of grapefruit juice.
2 cups of peaches mashed.

CHAPTER XII.

CREAM SAUCES.

Cream or white sauces are of two kinds, depending upon their use in cookery:

1. Medium cream sauce, used for cream soups and scalloped dishes.

2. Thick cream sauce, used for vegetables, fish and meat.

Method of mixing materials.

1. Scald milk in double boiler.
2. Melt butter in sauce pan.
3. Add flour to melted butter.
4. Add scalded milk slowly.
5. Stir mixture until smooth and thick in double boiler.
6. Add seasonings.
7. Use wooden spoon to stir the mixture.

Medium Thin Sauce.

1 tablespoonful of butter; 1 cup of milk; 1 tablespoonful of flour; $\frac{1}{4}$ teaspoonful of salt; few grains of pepper (white or paprika).

Thick Cream Sauce.

2 tablespoonfuls of butter; 1 cup of milk; 2 tablespoonfuls of flour; $\frac{1}{4}$ teaspoonful of salt; few grains of pepper (white or paprika).

Hot Sandwich Roll.

Stale finger rolls may be used. Cut center from rolls and fill them with creamed mushrooms. Set in broiler of gas range after filling and toast top of roll. Garnish with parsley.

CREAM SOUPS.

Cream soups are combinations of thin white sauce and strained vegetable pulp. They form a light and easily digested form of food for the sick. The vegetables most suitable for use in cream soups are: potatoes, peas, celery, tomatoes, beans, asparagus, corn and spinach. Onions are used for flavoring if desired.

Food Values.—Cream soups are high in food value. The milk or cream furnishes protein and fat in a digestible form, while the vegetables furnish starch and mineral salts. These soups are not suitable for use at a heavy meal, but for luncheon or extra nourishment between meals.

General Directions for Preparing Cream Soups.—1. Cook the vegetables in boiling salted water until soft enough to press through a sieve.

2. Make a white sauce by melting the butter, adding the flour and then the scalded milk slowly. Cook the white sauce thoroughly, stirring it during cooking. This is necessary to cook the starch in the flour.

3. Combine the cooked white sauce and the cooked and strained vegetable pulp; add seasoning, strain if desired and serve at once. After standing for any length of time, cream soups are apt to separate.

Cream of Celery Soup.

1 cup of milk; 1 tablespoonful of flour; 1 tablespoonful of butter; $\frac{1}{8}$ teaspoonful of salt; 1 small slice of onion; $\frac{1}{2}$ cup of celery; 1 cup of boiling water; pinch of paprika.

Cook the celery, cut into small pieces, in boiling water until tender. Let the water boil away toward the end of the cooking. Make the white sauce; combine with it the cooked

celery, put through a vegetable strainer; add the seasonings and serve at once. A spoonful of whipped cream may be put on top for a garnish.

Cream of Corn Soup.

1 cup of milk; 1 tablespoonful of flour; 1 tablespoonful of butter; 1 cup of cold water; $\frac{1}{4}$ teaspoonful of salt; pinch of paprika; $\frac{1}{2}$ cup of corn; small slice of onion.

Cook the onion, corn and cold water together for about twenty minutes. Make a white sauce by melting butter, adding flour and then scalded milk slowly, cooking until smooth and thick. Strain the corn and add to the white sauce. Mix well, add the seasonings and serve.

Cream of Tomato Soup.

1 cup of milk; 1 tablespoonful of butter; 1 tablespoonful of flour; 1 teaspoonful of sugar; $\frac{1}{2}$ cup of tomato; $\frac{1}{8}$ teaspoonful of salt; pinch of pepper; $\frac{1}{8}$ teaspoonful of soda.

Heat the tomato and the sugar together. Make the white sauce by melting the butter, adding flour and then scalded milk slowly. Mix well and serve as soon as possible, as it is apt to separate. Use whipped cream or finely chopped parsley for a garnish.

Cream of Spinach Soup.

1 tablespoonful of chopped cooked spinach; $\frac{2}{3}$ cup of milk; 1 tablespoonful of butter; $\frac{3}{4}$ tablespoonful of flour; $\frac{1}{8}$ teaspoonful of salt; pinch of paprika.

Add the spinach to the milk and bring it to the scalding point. Melt the flour and the butter in the double boiler; add milk mixture to them, mix well; add the seasonings, strain and serve.

Rice Soup.

2½ tablespoonfuls of rice; 1½ tablespoonfuls of butter; 1 stalk of celery; ¼ teaspoonful of salt and pepper; 2 cups of milk; ¼ small onion; ¼ bay leaf.

Scald milk, add well-washed rice and cook in double boiler for thirty minutes. Melt butter; add sliced onion; do not brown; then the celery and rice with the milk; add bay leaf, cover and let stand on back of range.

Cream of Pea Soup.

1 cup of milk; 1 tablespoonful of butter; ½ tablespoonful of flour; ½ cup of canned peas; ⅛ teaspoonful of salt; few grains of pepper; ¼ teaspoonful of sugar; ¼ cup of cold water.

Drain the peas and rinse them thoroughly; add the sugar and cold water and simmer for ten minutes. Rub through a sieve; add to the white sauce, made by melting butter, adding flour, and then scalded milk slowly. Cook until thick and smooth. Add seasonings; strain into a hot cup and serve at once.

Cream of Potato Soup.

1 cup of milk; 1 small slice of onion; ¼ cup of mashed potato; few grains of celery salt; ½ tablespoonful of butter; ¼ teaspoonful of salt; few grains of pepper.

Scald the milk and the onion together. Strain the milk slowly into the potatoes; add the butter and the seasonings; stir until well mixed; heat and strain into a hot cup. A little parsley may be added for a garnish.

Cream of Asparagus Soup.

½ cup of asparagus tips; 1 cup of milk; 1 tablespoonful of butter; 1 tablespoonful of flour; ⅛ teaspoonful of salt; few grains of pepper.

Cook the asparagus tips in a little water until tender. Strain them, add to the milk; melt butter, add flour; then milk and asparagus slowly. Add the seasonings and the yolk of egg well beaten. Let the mixture cook for two minutes after the egg is added; then strain it through a sieve before serving. A little whipped cream may be used for a garnish, or beaten in before serving.

Cream of Cauliflower Soup.

1 cup of milk; ½ tablespoonful of butter; ¾ tablespoonful of flour; ¼ cup of cooked cauliflower; ¼ teaspoonful of salt; pinch of paprika.

Melt the butter, add flour and then scalded milk slowly. Add cauliflower, chopped finely. Stir constantly until thick and smooth; add seasonings; strain and serve.

Oyster Stew.

1 cup of oysters; ¼ teaspoonful of salt and pepper; 1½ cups of milk; 1 tablespoonful of butter.

Scald the milk. Put oysters in strainer over the bowl; wash carefully with as little water as possible. Pick over oysters to remove particles of shell. Heat the liquor strained from oysters to the boiling point; strain through cheesecloth. Add liquor and oysters to scalded milk; season and serve immediately.

CHAPTER XIII.

EGGS.

Food Value.—The egg represents a concentrated and a fairly ideal form of food. Aside from supplying protein and fat, the egg is rich in lime, iron, sulphur and other minerals.

Digestibility.—Cooking may impair or improve the food value of eggs. Raw egg white does not stimulate the flow of the digestive juices and is not considered as digestible as an egg cooked at 160° F. Cooking at a higher temperature densely coagulates the albumen and lessens its digestibility. An egg cooked at too high a temperature requires approximately twice the time for digestion that an egg cooked at an ideal temperature does.

Composition.—[1]

	Protein, per cent.	Carbohydrate, per cent.	Fat, per cent.
Whole egg as purchased	11.9	..	9.3
Whole egg, edible portion	13.4	..	10.5
White	12.3	..	0.2
Yolk	15.7	..	33.3

Tests for Fresh Eggs.—1. The shell of a fresh egg is slightly rough.

2. Fresh eggs appear clear when placed between the eye and a light.

Preservation.—1. Cold storage is the most approved method. However, any method which excludes air will help to keep eggs fresh.

2. Pack in sawdust, salt or bran, small end down.

3. Put up in water glass.

[1] Eggs and Their Uses as Food, Farmers' Bulletin, No. 128. This table shows that the fat is found in the yolk. It is in the form of lecithin. The protein is in the form of albumin and globulins.

COOKERY OF EGGS.

Soft-cooked or Coddled Eggs.

Put the egg in one pint of boiling water, cover. Remove from the fire and let it stand eight minutes.

Baked Eggs.

Break egg into a well-buttered cup or casserole; sprinkle with salt, dot with ½ teaspoonful of butter, add ½ tablespoonful of cream. Bake in pan of hot water in moderate oven until white is set.

Egg Nest.

Toast bread. Separate egg. Beat white to a froth; add salt. Spread toast with butter and put white of egg on in shape of nest. Make a depression in center, put in ¼ teaspoonful of butter and drop in yolk. Cook in moderate oven three or four minutes. This may be served with tomato sauce.

Poached or Dropped Eggs.

Toast a square or round of bread. Break egg into a dish, then drop into a shallow pan two-thirds full of boiling salted water. When there is a film on top and white is firm, remove egg to toast, using a skimmer. Garnish.

Creamed Eggs.

Beat egg until light, add ¼ cup of milk, a little salt and 1 teaspoonful of melted butter. Put into the top of a double boiler and stir constantly until mixture thickens. Serve on toast or hot rice.

Foamy Omelet.

Separate egg and beat white to a froth. Beat yolk until light, add 1 tablespoonful of milk; salt and pepper to taste; lightly fold in the white. Put 1 tablespoonful of butter into hot omelet pan; when melted, add egg mixture. Gently shake pan so that egg will not adhere to it; loosen edges with spatula and when delicately brown on bottom, set pan in hot oven one or two minutes, to dry omelet on top. Fold omelet half over and serve immediately. Chopped meat, parsley or prepared sauce may be spread on omelet before folding.

CUSTARDS.

Soft Custard.

2 cups of scalded milk; 2 tablespoonfuls of sugar; $\frac{1}{2}$ teaspoonful of vanilla; 3 egg yolks; $\frac{1}{4}$ teaspoonful of salt.

Beat eggs slightly, add sugar and salt, stir into hot milk slowly; pour into double-boiler. Cook, stirring constantly until thick enough to coat spoon. Strain and stir in vanilla. If custard begins to curdle, put top of double boiler in cold water. Beat mixture with Dover egg-beater.

Baked Custard.

1 quart of milk; 4 to 6 eggs; $\frac{1}{4}$ cup of sugar; $\frac{1}{8}$ teaspoonful of salt.

Beat eggs and stir in dry ingredients and then hot milk. Pour into buttered molds. Set in pan of hot water. Bake in moderate oven for twenty to thirty minutes. To test when cooked, insert paring knife dipped in center of custard.

It will come out clean when custard is firm. Custard baked too fast or too long will be honey-combed and will break down.

Beef-tea Custard.

1 cup of hot beef stock; yolks of 3 eggs; ½ teaspoonful of salt; seasonings, if allowed, of parsley, spices, celery, etc.

Prepare as for boiled custard; stir constantly until thick. Serve hot or cold.

CHAPTER XIV.

MILK.

AVERAGE COMPOSITION OF MILK PRODUCTS.[1]

Material.	Water, per cent.	Protein, per cent.	Fat, per cent.	Carbohydrate, per cent.	Ash, per cent.
Whole milk	87.0	3.3	4.0	5.0	0.7
Skimmed milk	90.5	3.4	0.3	5.1	0.7
Cream	74.0	2.5	18.5	4.5	0.5
Buttermilk	91.0	3.0	0.5	4.8	0.7
Whey	93.0	1.0	0.3	5.0	0.7
Condensed milk:					
Unsweetened	71.3	7.4	8.5	11.1	1.7
Sweetened	26.0	8.2	9.6	54.3	1.9
Butter	13.0	1.0	83.0	..	3.6
Cheese:					
American Cheddar	33.5	26.0	35.5	1.5	3.5
Cottage	53.0	19.6	23.2	2.1	2.1
Swiss	31.4	27.6	34.9	1.3	4.8
Milk powder from milk (skimmed)	3.0	34.0	3.1	51.9	8.0
Kephir	89.6	3.1	2.0	4.5	0.8
Koumyss	90.7	2.2	2.1	4.1	0.9

Milk is a typical protein food, the protein being in the form of casein and albumin. The casein contains phosphate and lime. The carbohydrate of milk is in the form of lactose or milk sugar, and the fat is in a finely divided state, which rises to the top in the form of cream. Vitamins are present in milk, and these, as well as the protein constituents of the milk, are destroyed by high temperature. The conclusion is that fresh raw milk is preferable to pasteurized or sterilized milk.

Food Value of Milk.—While milk contains all of the food principles, they are not present in correct proportions to sustain adult human life. Human milk is a perfect food for infants, but for adults the proportion of sugar is not high

[1] U. S. Department of Agriculture, Farmers' Bulletin, No. 363.

enough to give the proper amount of energy, and the proportion of water is so great that very large quantities of milk have to be taken in a day to furnish food for tissue-building and for energy production.

Digestibility of Milk.—Milk forms a curd in the stomach as a result of the action of rennin in the gastric juice. If milk is taken in very rapidly the curd is heavy and dense. If it is taken in slowly and combined with other food, as cereal water, the curd is light and flocculent. Commercial rennet is obtained from the lining of the stomach of the calf, and is used to make desserts.

Souring of Milk.—Milk sours because lactic acid bacteria which develop in it changes the sugar in the milk to lactic acid. This acid causes the casein to precipitate in the form of a curd. The liquid part contains sugar and salts and is known as whey.

Certified Milk.—This is milk containing not more than 10,000 bacteria per cubic centimeter. Such milk can be produced only in model dairies.

Pasteurized Milk.—Pasteurized milk is deficient in the anti-scorbutic vitamin, the absence of which in infant food tends to produce infantile scurvy. Consumers are protected, however, by pasteurization, since the process destroys bacteria resulting in typhoid, scarlet fever, septic sore throat and bovine tuberculosis. Pasteurized milk is prepared by holding it at from 145° F. to 165° F. for thirty minutes and chilling it immediately. There will be less vitamin destruction if it is kept at the lower temperature.

The home method of pasteurization is as follows:

1. Sterilize bottles, fill them with milk and insert stoppers of baked cotton. If milk comes bottled, it may be left in the original container and a hole may be made in the cover through which to insert a milk thermometer.

2. Set the bottles on a rack in a large pan of cold water and heat until the contained milk is 145° F. Hold this temperature for thirty minutes.

3. Chill by putting pan under faucet and allowing cold water to gradually replace the hot. Place on ice immediately.

Sterilized Milk.—In boiled milk there is a precipitation of the mineral salts; the casein is rendered less susceptible to the action of rennin and pepsin and a part of the albumin is precipitated. Sterilized milk is milk held at 212° F. for one and a half hours. This destroys bacteria of the Bacillus coli group, but it renders the milk very indigestible. The pediatrists believe that milk boiled for from two to ten minutes is sufficiently protected for infant-feeding. This milk, however, cannot be said to be entirely sterile.

Koumyss.—This is an imitation of fermented mares' milk, used as a beverage in certain localities in Europe. Patients who cannot tolerate whole milk may be able to digest koumyss. Its casein is in an easily digestible form; the carbon dioxide gas it contains encourages the action of the stomach, and the alcohol formed is slightly stimulating.

Koumyss.

1 quart of milk; $\frac{1}{4}$ yeast foam cake; 1 tablespoonful of lukewarm water; 2 tablespoonfuls of sugar.

Add the sugar to the milk and the yeast, the latter having been dissolved in lukewarm water. Mix thoroughly. Pour into sterile bottles within two inches of the top. Cork securely in bottles having a patent top. Let them stand at the ordinary room temperature for six hours. Place on ice for twenty-four hours.

Peptonized Milk.—This may be made by either one of the following methods:

1. The immediate process in which the peptonizing powder is merely shaken into the milk and the milk then iced.

2. *Partial Peptonization.*—Take 1 tube of Fairchild's peptonizing powder, ¼ cup of cold water and 2 cups of fresh cold milk. Shake the water and the powder together in a jar; add the milk and shake again. Set jar in warm water; keep temperature at 130° F. for twenty minutes. Put on ice at once. This may be served with any seasoning prescribed by the physician.

3. *Completely Peptonized Milk.*—Milk is completely peptonized by placing the mixture in No. 2 at a temperature of 120° F. maintained for two hours. This method is apt to develop a bitter taste.

Malted Milk.

1 tablespoonful of Horlick's malted milk; 2 tablespoonfuls of tepid water; salt. Make a paste with the above; add 1 cup of water, cold or hot, or of milk, to which cream may be added. Add the liquid gradually; stir briskly; serve preferably hot.

Junket.

1 cup of fresh milk; 1 teaspoonful of cold water; ¼ junket tablet.

Crush the junket tablet. Heat the milk until lukewarm. Add the junket, dissolved in cold water. Keep in a warm place until firm. Chill. Serve plain or with whipped cream, nutmeg or cinnamon.

Lemon Whey.

1 pint of hot milk; 4 tablespoonfuls of lemon juice; 2 teaspoonfuls of sugar.

Add the lemon juice mixed with sugar to the milk. When milk has curdled, strain it through cheesecloth.

Cottage Cheese.

1. 1 quart of sour milk; $\frac{1}{4}$ teaspoonful of salt; 2 tablespoonfuls of cream.

Heat to the boiling point the sour milk. Remove from the fire and allow it to stand until the curd separates from the whey. Strain through a cheesecloth. Press until dry. Add the salt and cream and mix well. This makes one-half cup of cottage cheese.

2. 1 quart of sweet milk, 1 rennet tablet.

Heat, to luke warm, the sweet milk. Remove from the fire. Dissolve rennet tablet in 1 tablespoonful of cold water and add to the warm milk. Allow the mixture to stand at room temperature until firm—about one hour. Strain through a cheesecloth. Press until dry.

CHAPTER XV.

STARCH—CEREALS—VEGETABLES.

Cooking of Starch.—The covering of the starch granule is a delicate form of cellulose. Hot water and long cooking break down this covering and make the starch digestible. Each granule of starch must be held apart, as in an emulsion, by some material such as sugar, fat or cold water, to prevent a tendency to lumping when the starch is treated with heat and water. Examples of food preparations in which lumping is prevented by mixing starch with sugar is cornstarch pudding, water in the making of gravy, combining starch with a fluid fat as in a cream sauce.

Blanc Mange.

1 quart of scalded milk; $\frac{1}{4}$ cup of cornstarch; $\frac{1}{4}$ cup of sugar; few grains of salt; 2 tablespoonfuls of cold water or milk; whites of 3 eggs (if desired).

For chocolate blanc mange, melt 1 square of chocolate and add 4 tablespoonfuls of sugar to recipe.

Mix starch, sugar and salt with water, stir into hot milk. Stir until the mixture thickens. Cover and let it steam for twenty minutes. If the whites of eggs are used, beat stiff and fold into the pudding after removing from fire; add flavoring; pour into mold; chill quickly.

Cooking of Cereals.—Boil for ten minutes directly over the flame in a large quantity of water, already boiling and to which salt has been previously added. Stir until well mixed with a fork. Then put it in the top of a double boiler and

allow it to cook the required length of time. Fruit may be added to the cereal half an hour before removing it from the fire; as, for example, figs, dates, apples, prunes.

Cooking of Vegetables.—1. Put vegetables in boiling water, using as small an amount as possible, excepting in the case of the more strongly-flavored vegetables.

2. Leave the skins on if possible while cooking.

3. Remove from the fire when tender and drain at once.

4. Keep covered while cooking to retain the flavor.

5. Add salt when half-cooked in order to keep vegetables tender.

6. Strongly-flavored vegetables should be cooked in a large amount of water and the water should be changed two to four times. Small pieces of bread, potato or charcoal tied in a cloth will absorb some of the flavor if placed in the water.

7. Water in which vegetables of not too strong flavor have been cooked should be saved and used in soup-making. It contains valuable principles.

Boiled Potatoes.

Select potatoes of uniform size, scrub and remove spots, put into boiling water, boil for twenty minutes, or until tender. Drain off the water, shake the pan over the fire to make the potatoes dry and mealy. Remove skins and serve in a hot uncovered dish.

Mashed Potatoes.

Mash boiled potatoes in a hot buttered dish; add seasonings and a little hot milk. Beat with a fork to make light and creamy.

Scalloped Potatoes.

Wash, pare and cut potatoes into thin slices; place in buttered baking dish; sprinkle with salt and pepper; dredge with flour and dot with small pieces of butter. Repeat these layers until the dish is almost full. Add hot milk until it may be seen through top layer. Bake one hour, or until potatoes are soft, in a moderate oven.

Baked Potatoes.

Select potatoes of uniform size; wash and scrub; prick to allow steam to escape. Bake in a hot oven forty-five to fifty minutes. When baked, break open slightly; serve on folded napkin.

Asparagus.

Wash, cut into two-inch pieces. Cook in boiling salted water until tender; put in flower end of stalks when stalks are partly cooked, as they require less time for cooking. Drain off water, season, arrange on toast, pour over white sauce, if desired, or drawn butter.

Carrots.

Wash and scrub; cook entire and then cut into $\frac{1}{4}$-inch cubes. Cook in boiling water until soft, about one hour. Serve with white sauce. When possible, boil carrots whole; when cold cut into cubes and reheat in sauce.

Boiled Onions.

Put onions in cold water. Remove skins under water. Drain, put in boiling salted water; cook ten minutes. Drain, cover again with boiling water; do not cover dish while cooking. Boil until tender, drain; add small quantity of hot milk, butter and seasonings.

Carrot Mounds.

Cut carrots, either before or after cooking, into small cubes of $\frac{1}{2}$ inch. Drain carefully and season with salt and pepper. Stick pieces together with thick white sauce. Press mixture firmly into a well-buttered bowl; let it stand in hot oven five minutes. Invert on plate, garnish with parsley or small green peas. Surround with white sauce.

Turnip Cups.

Scoop out center from flat turnips which have been pared. Boil the whole; remove from water the minute they are done. Dry out over low flame; season; fill cavity with tiny cubes of turnip and carrots (and peas if at hand). Heat the filling first in a small amount of butter; also season highly and garnish with parsley. Serve, as individual dish, with white sauce.

Spinach Balls.

Boil spinach until tender; drain, add to thick white sauce. Form into balls, serve with white sauce as a garnish or use hot mayonnaise in place of white sauce.

Stuffed Onions.

Boil until nearly tender; drain and cool. When they can be comfortably handled, remove centers, chop fine and mix with bread crumbs and any chopped meat, as ham, chicken or veal. Pack centers quite full; put a few buttered crumbs on top. Bake about twenty minutes, basting every five minutes. Serve as a garnish for roast pork, mutton or chops.

Cabbage au Gratin.

Cook cabbage; shred into buttered baking dish. Pour white sauce on and mix slightly. Add salt, red pepper and grated cheese if desired. Cover with buttered crumbs and bake twenty minutes.

Stuffed Tomatoes.

Wipe and remove thin slices from stem end of six medium-sized tomatoes. Take out seeds and pulp; sprinkle inside of tomatoes with salt and let them stand inverted for one hour. Cook for five minutes 2 tablespoonfuls of butter with ½ tablespoonful of chopped onion. Add ½ cup of finely chopped cold chicken or veal, ½ cup of stale bread crumbs and tomato pulp; season to taste. Cook five minutes; add one egg, slightly beaten. Cook one minute. Refill tomatoes with mixture. Place in a buttered pan; sprinkle with buttered cracker crumbs and bake twenty minutes in a hot oven.

Stuffed Potatoes.

Cut slices from the top of six medium-sized baked potatoes. Scoop out inside; mash, add 2 tablespoonfuls of butter, salt, pepper and 3 tablespoonfuls of hot milk. Then add whites of 2 eggs, well beaten. Refill skins and bake for five to eight minutes in a very hot oven. Potatoes may be sprinkled with grated cheese before putting in the oven.

Rice.

Wash rice in cold water by scrubbing between the hands. Sprinkle the washed rice in six times its volume of boiling water; boil until rice is tender; drain, cover with cold water. Drain again and shake dry over fire or dry in the oven. This

may be served as a potato substitute or combined with eggs and fruit as a pudding. It is sometimes served as a dessert, in cereal bowls, with butter and maple syrup.

Hollandaise Sauce.

½ cup of butter; 2 egg yolks; 2 tablespoonfuls of lemon juice; ¼ teaspoonful salt; few grains cayenne pepper; ⅓ cup of boiling water.

Put butter in bowl; cover with cold water; wash, using a wooden spoon. Divide in three pieces; put one piece in top of a double boiler with yolks of eggs and lemon juice; stir constantly until butter is melted; add second piece of butter, and, as it thickens, a third piece. Add water, cook five minutes and season.

CHAPTER XVI.

GELATIN.

Food Value.—Gelatin is an incomplete protein. It lacks tyrosin and tryptophan, without which it cannot perform all the functions of a true protein. It is obtained by boiling collagen.

While gelatin itself is lacking in full food value, it can be used as a vehicle to carry other foods.

Effect of Water on Gelatin.—Gelatin does not dissolve, but softens and swells in cold water. It dissolves completely in hot water and thickens upon cooling. Boiling will destroy this thickening property.

Tomato Jelly.

2½ cups of cooked tomato; 1 slice of onion; 1 stalk of celery; 1 bay leaf; 2 cloves; ½ teaspoonful of salt; ½ cup of cold water; 1 piece of red pepper; ½ cup of mushroom parings; 1 tablespoonful of vinegar; 2 tablespoonfuls of gelatin.

Cook tomatoes, with all except the three last ingredients, for fifteen minutes. Add vinegar and gelatin softened in cold water. Stir until the gelatin is dissolved. Strain and pour into molds.

Springtime Salad.

2 tablespoonfuls of gelatin; ½ cup of cold water; ½ cup of acid (vinegar or lemon); 2 cups, in all, of celery, pimentoes, pineapple, white of hard-cooked egg, cut fine; ½ cup of sugar; 1 teaspoonful of salt; 2 cups of boiling water.

Soften gelatin in cold water; dissolve in boiling water. When it begins to thicken, add remaining ingredients. Serve in lettuce-hearts with mayonnaise.

Aspic Jelly.

1½ cups of cold water; 1 tablespoonful of chopped celery; 1 tablespoonful of chopped carrot; 1 sprig of parsley; 3 cloves; 2 bay leaves; 1 sliced onion.

Simmer one hour. Add 1 teaspoonful of meat extract dissolved in ½ cup of hot water and 2 tablespoonfuls of gelatin soaked in ½ cup of cold water. Strain and pour into mold.

Lemon Jelly.

2 tablespoonfuls of gelatin; ½ cup of cold water; 2½ cups of boiling water; 1 cup of sugar; ½ cup of lemon juice.

Soak gelatin in cold water; dissolve in boiling water. Add remaining ingredients, strain, mold and chill.

Imperial Pudding.

½ cup of rice; 1 pint of milk; 2 tablespoonfuls of gelatin; ½ cup of cold water; 1 cup of candied cherries; ¼ teaspoonful of salt; 1 cup of sugar; ½ teaspoonful of flavoring; ½ pint of whipped cream; ½ cup of boiling water.

Cook rice in boiling water. Drain and combine with milk. Cook one hour in double boiler. Soften gelatin in cold water; dissolve in boiling water; add salt, sugar and flavoring. Combine with rice and chill. Stir often. When thick add whipped cream and candied cherries cut fine. Mold in individual cups or sherbet glasses and serve with whipped cream.

Snow Pudding.

1 tablespoonful of gelatin; ¼ cup of cold water; ¼ cup of lemon juice; 1 cup of boiling water; 1 cup of sugar; whites of 3 eggs.

Soak gelatin in cold water. Dissolve in boiling water; add sugar and lemon juice. Chill until quite thick and then beat to a froth. Add whites of eggs, beaten stiff, and continue beating until stiff enough to hold its shape. Pile in sherbet cups and pour soft custard over it.

Almond Cream.

1 cup of heavy cream; ½ cup of hot milk; ½ cup of cold milk; 2 teaspoonfuls of vanilla; 1 tablespoonful of gelatin; 1 pound of chopped almonds.

Soak gelatin in cold milk, dissolve in hot milk; cool and add cream. Beat until stiff; add brown, blanched almonds and serve in cups lined with lady-fingers.

CHAPTER XVII.

DESSERTS.

Food Value.—These preparations may be highly decorative and lend a gay touch to the tray that will appeal to the patient. Aside from this, they contribute an appreciable amount of food value. They are generally built on egg, cream or gelatin foundations and highly sweetened. It is fitting that they should come at the close of a meal, since they quickly impair the appetite.

Tapioca Cream.

1½ tablespoonfuls of minute tapioca; 2 cups of scalded milk; 2 eggs; ⅓ cup of sugar; ¼ teaspoonful of salt; ½ teaspoonful of vanilla.

Wash tapioca; add salt and milk and cook in a double boiler until the tapioca is transparent. Beat eggs and add sugar. Whip the hot mixture into the beaten egg. Stir over fire in double boiler for five minutes. Add vanilla and chill.

Lemon Rice Pudding.

½ cup of cooked rice; 3 cups of milk; ½ cup of sugar; juice and grated rind of 1 lemon; ¾ teaspoonful of salt; 2 egg yolks; 2 egg whites; 3 tablespoonfuls of sugar.

Combine cooked rice, egg yolks, salt and sugar, thinned with lemon. Make meringue by whipping 3 tablespoonfuls of sugar into the egg whites. Spread over the rice mixture. Bake in a buttered pan for ten minutes.

Lemon Sponge.

4 egg yolks; 4 tablespoonfuls of sugar; 1 lemon (rind and juice); 4 egg whites.

Combine beaten egg yolks, sugar and lemon. Cook in double boiler until it thickens. Chill and whip in egg whites. Serve immediately.

Dainty.

1 cup of marshmallows; ½ cup of candied cherries; 1 pint of whipping cream; 1 teaspoonful of sugar; rose extract.

Whip cream; add sugar, candied cherries and, lastly, the marshmallows. Sprinkle with chopped nuts and let it stand overnight. Serve in sherbet cups.

Prune Whip.

2 cups of prunes; ½ cup of sugar; 1 teaspoonful of lemon juice; 2 egg whites.

Wash prunes. Soak until soft. Cook in same water until tender. Remove stones and rub through a sieve; add sugar. Cook about five minutes. Beat whites of eggs and add prunes when cold. Add lemon juice and bake in buttered bakers, which are set in hot water for twenty minutes. Serve with soft custard or cream.

Apricot Whip.

Same recipe as prune whip, using apricots instead of prunes.

Date Pudding.

2 cups of water; 1 cup of brown sugar; 3 tablespoonfuls of cornstarch; ¼ teaspoonful of salt; 1 cup of sliced dates.

Boil sugar and water for ten minutes. Add cornstarch

and salt, mixed with 2 tablespoonfuls of cold water. Cook five minutes. Add dates. Serve in dessert dishes and garnish with whipped cream.

Agar Jelly.

1 tablespoonful of prepared agar; 4 tablespoonfuls of fruit juice; ¾ cup of boiling water.

Chill and serve with whipped cream. Chopped nuts or fruits may be added. Any fruit juice or combination of juices may be used.

Agar Jelly with Saccharin.

8 tablespoonfuls of prepared agar; 2 quarts of water; 8 grains of saccharin.

Allow agar to soak in water overnight. Bring to the boiling point; add saccharin. May be served with cream and nuts and fruit added to disguise it. This is used in diabetic cookery, in obesity, or where bulk is desired in the diet.

Caramel Custard.

½ cup of sugar; 4 cups of milk; 2 tablespoonfuls of water; 1 teaspoonful of vanilla; 6 eggs; ½ teaspoonful of salt.

Melt sugar in saute pan until light brown and add water. Combine all ingredients, beating eggs slightly. Bake in a moderate oven in buttered pans, set in a pan of hot water.

Strawberry Fluff.

5 eggs (separated), beaten; ⅔ cup of sugar added to yolks; 1 cup of mashed strawberries; 1 teaspoonful of lemon juice.

Cook in double boiler for one minute. Add beaten whites. Serve very cold.

Walnut Maple Souffle.

1 cup of hot milk; $\frac{1}{8}$ teaspoonful of salt; 2 tablespoonfuls of flour; 2 tablespoonfuls of butter; 3 yolks; 3 tablespoonfuls of sugar; 1 cup of maple syrup; 3 egg whites; $\frac{1}{2}$ cup of nuts.

Combine first four ingredients, cook in a double boiler for ten minutes. Pour over three beaten yolks, adding the sugar. Flavor with 1 cup of maple syrup and cool. Put a little butter over the top to prevent a crust forming. Fold in the whites of three eggs and nuts. Bake in buttered dish for thirty-five minutes in a moderate oven.

Orange Cream Pudding.

$\frac{3}{4}$ cup of orange juice; $\frac{3}{4}$ cup of sugar; 1 tablespoonful of lemon juice; 3 eggs; rind $\frac{1}{2}$ of orange.

Put rind and lemon juice in double boiler. Stir in $\frac{1}{2}$ cup of sugar. Add $\frac{1}{4}$ cup of sugar to yolks and cook as a soft custard; when thick and smooth beat into stiffly beaten whites. Pour over sponge cake.

Maple Cream Toast.

Slices of stale toasted sponge cake are spread lightly with soft maple sugar. Whip $\frac{1}{2}$ pint of cream; add $\frac{1}{2}$ cup of nut meats; sweeten with maple sugar; flavor with vanilla; pile on toasted cake.

Lemon Meringue Pudding.

$\frac{2}{3}$ cup of rich milk; 2 tablespoonfuls of sugar; 1 tablespoonful of melted butter; pinch of salt; $\frac{1}{3}$ cup of cold milk; 1 cup of bread crumbs; 1 egg; rind $\frac{1}{4}$ lemon; juice $\frac{1}{2}$ lemon; $\frac{1}{3}$ cup of sugar.

Heat $\frac{2}{3}$ cup of milk; add 1 tablespoonful of sugar, butter and crumbs. Do not stir but keep hot. Beat egg yolk, add

1 tablespoonful of sugar, lemon, salt and cold milk. Combine mixtures. Bake, covering with a meringue of the remaining ingredients, for twenty minutes.

Chocolate Custard.

1½ square of chocolate; 2 tablespoonfuls of sugar; ¼ cup of water; 3 egg yolks; ⅓ cup of sugar; 1 egg white; 1 cup of milk.

Melt chocolate and add 2 tablespoonfuls of sugar and ¼ cup of water. Stir until smooth and boiling. Beat 3 egg yolks and 1 white; add ⅓ cup of sugar and beat again. Fold in one white beaten dry. Add chocolate mixture and 1 cup of milk and mix thoroughly. Butter baking dishes and dredge with granulated sugar. Bake until firm in a moderate oven, setting the custard cups in a pan of water.

Preparation of Fresh Fruits.

Whenever possible serve fresh fruits in their natural state—that is, uncooked. Their flavor is much better, they are more appetizing and, in most cases, they are as digestible as cooked fruit.

1. *Berries.*—Wash all berries when they come from the market before removing stems or hulls. Serve cold with powdered sugar and cream.

2. *Oranges.*—Wipe fruit with a clean damp cloth. Serve in any of the following ways:

(*a*) Remove the juice and strain into a cold glass. Add sugar if necessary.

(*b*) Cut in halves; loosen pulp by cutting into sections. Remove seeds, sprinkle with powdered sugar, chill and serve. A spoonful of sherry may be added to grapefruit if desired.

(*c*) Peel, remove all white skin, then break the fruit pulp

carefully into sections. Arrange in a circle around a mound of powdered sugar. The skin may also be removed from the sections before serving if desired.

(*d*) Orange and grapefruit cocktail. Mix equal parts of diced orange and grapefruit pulp. Sprinkle with sugar; add a few drops of lemon juice. Serve in chilled glasses, garnished with a sprig of fresh mint or a Maraschino cherry.

3. *Watermelon.*—Cut small balls from the ripest part of the melon with a vegetable cutter. Arrange in a mound on a fresh grape leaf, or pile in a sherbet glass and garnish with mint.

4. *Apples.*—Apples are seldom used raw in serving fruit to the sick. They may, however, be cooked in a number of digestible and appetizing ways:

Baked Apples.

Select as many good apples of uniform size as may be needed. Wash, pare and core them. Place them in a granite baking dish, fill the center of each apple with sugar, add a piece of butter on the top of each. Add enough water to cover the bottom of the pan. Bake in a hot oven until soft, basting often with the juice in the pan. Chill and serve plain, with whipped cream or with soft custard.

Apple Snow.

Pare, core and cut four apples into quarters. Cover with boiling water. Cook slowly until apples are very soft and water has almost evaporated. Cool, put through a vegetable sieve; add powdered sugar to taste and fold in half as much whipped cream as you have apple pulp. Chill and serve.

Apples, Cuban Style.

Pare and core sound tart apples. Steam until almost tender; remove to a buttered baking dish; fill cavities with cocoanut; stick apples with blanched almonds; baste with syrup made of sugar and water and lemon juice. Finish cooking in a hot oven, basting often. Serve garnished with jelly or whipped cream.

Banana Baked in the Skin.

Open skin of banana on one side enough to loosen it entirely except at the end. Put it into a shallow pan; sprinkle with sugar and a little lemon juice. Bake until the skin is delicately browned and the pulp quite soft. Garnish with a spoonful of jelly and whipped cream.

Baked Bananas.

Remove the skin from a banana and scrape to remove coarse pulp. Melt 2 tablespoonfuls of butter in a granite baking pan; put in the banana, sprinkle with sugar and a few drops of lemon juice. Bake slowly, turning the banana once and basting during cooking. Serve cold.

Senna Prunes.

Prepare senna infusion by putting half an ounce of senna leaves into a pan provided with a cover. Pour over the leaves 1 quart of boiling water and allow it to stand for half an hour. Strain and pass enough water through the strainer to make the infusion measure 1 quart. Soak 1 pound of prunes in this infusion overnight. Cook prunes until soft, adding enough water to have 1 quart of juice when the cooking is over. Patients may be given this in decreasing doses, beginning with 6 prunes and 6 teaspoonfuls of juice, for breakfast and supper, and gradually cutting it as the need for a laxative lessens.

CHAPTER XVIII.

FROZEN DESSERTS.

Patients are very grateful for frozen preparations. They are a means of pushing the use of fluids, adding fruit juices to the diet and give an opportunity of selection. They contribute variety for the patient on liquid diet.

Frozen desserts include:

1. Ices: fruit juices sweetened, diluted with water and frozen.

2. Sherbets: fruit juices sweetened; diluted with water and combined with beaten whites of eggs. Milk may be used in place of water.

3. Frappe: ices frozen coarsely to a granular consistency; equal parts of salt and ice are used and the freezer turned rapidly.

4. Philadelphia cream: cream sweetened, flavored and frozen.

5. Custard ice-creams: custard foundation combined with cream and flavoring.

6. Parfait, whipping cream, beaten until stiff; combined with egg white into which has been beaten the hot syrup, flavored, placed in a mold, packed in salt and ice (using 2 parts of ice to 1 of salt) and allow to stand three hours.

In freezing creams, ices, etc., use 3 parts of ice to 1 of salt.

Lemon Ice.

4 cups of water; $\frac{3}{4}$ cup of lemon juice; 2 cups of sugar.

Make a syrup by boiling the water and sugar for twenty-minutes. Add lemon juice, cool, strain and freeze.

Orange Ice.

4 cups of water; 2 cups of orange juice; 2 cups of sugar; ¼ cup of lemon juice; grated rind of 2 oranges.

Make a syrup as for lemon ice; add fruit juice and orange rind; strain and freeze.

White Velvet Sherbet.

The juice of 4 lemons; the thinly shaved peel of 1 lemon is soaked in the juice for half an hour. Strain the juice and add enough sugar to thicken mixture; add 1 quart of milk and turn at once into the freezer. Turn slowly at first and rapidly as it thickens.

Raspberry Ice.

1 quart of raspberries; 1 cup of water; 1 cup of sugar; ¼ cup of lemon juice.

Sprinkle the raspberries with sugar; cover and let them stand for two hours. Mash, sqeeze through sieve, add water and lemon juice to taste; then freeze. Raspberry ice prepared in this way retains the natural color of the fruit.

Strawberry Ice.

Prepare the same as raspberry ice.

Pineapple Frappe.

2 cups of water; 2 cups of ice water; 1 cup of sugar; 1 pint of grated pineapple; juice of 3 lemons.

Make a syrup of the water and sugar, boiling it for fifteen minutes. Add the pineapple and lemon juice; cool; strain, and add ice water; freeze to a mush, using equal parts of ice and salt.

Grape Frappe.

4 cups of water; 2 cups of grape juice; $\frac{1}{4}$ cup of lemon juice; 2 cups of sugar; $\frac{2}{3}$ cup of orange juice.

Prepare and freeze as for pineapple frappe.

Philadelphia Ice-cream.

1 quart of cream; $\frac{3}{4}$ cup of sugar; $\frac{1}{2}$ teaspoonful of vanilla.

Mix ingredients and freeze.

Cranberry Frappe.

1 quart of cranberries; 2 cups of sugar; 2 cups of water; juice of 2 lemons.

Cook cranberries in water for eight minutes, then force through a sieve. Add sugar and lemon juice and freeze to a mush. This may be served with a meat course of dinner in place of sauce or jelly.

Vanilla Ice-cream.

2 cups of scalded milk; 1 cup of sugar; $\frac{1}{3}$ teaspoonful of salt; 1 tablespoonful of flour; 1 egg; 1 quart of cream.

Mix flour, sugar and salt; add egg slightly beaten and milk gradually. Cook in the top of a double boiler for twenty minutes, stirring constantly. When cool, add cream and flavoring; strain and freeze.

Chocolate Ice-cream.

Use recipe for vanilla ice-cream. Melt 2 squares of chocolate; add hot custard slowly; cool and add cream.

Caramel Ice-cream.

1 quart of cream; 1½ cups of sugar; 1 tablespoonful of flour; ½ teaspoonful of vanilla; 2 cups of milk; 1 egg; ⅓ teaspoonful of salt.

Prepare the same as for vanilla ice-cream, using only ½ of the sugar. Caramelize remaining sugar and add slowly to hot custard. Freeze.

Angel Parfait.

1 cup of sugar; whites of 3 eggs; ¾ cup of water; 1 pint of heavy cream; 1 tablespoonful of vanilla.

Make syrup of sugar and water, boiling to thread. Pour slowly on beaten whites; continue beating until mixture is cool. Add cream, beaten stiff; add vanilla; freeze.

Maple Parfait.

4 eggs; 1 pint of thick cream; 1 cup of hot maple syrup.

Beat eggs slightly; pour on maple syrup slowly. Cook until mixture thickens; cool, add cream, beaten until stiff. Mold, pack in salt and ice and let it stand for three hours.

Rose Petal Mousse.

1 cup of sugar; whites of 3 eggs; 1 teaspoonful of rose extract; ¼ cup of water; fragments of rose petals from 6 roses.

Boil the sugar and water until a thread will form. Add the rose petals; cool, beat into well-beaten whites of eggs. Flavor. When stiff, pour into mold. Pack mold in 3 parts of ice to 1 part of salt. Let it stand three hours.

CHAPTER XIX.

SALADS.

Composition.—A salad formerly meant a green, crisp vegetable, dressed with oil, vinegar, salt and pepper. The term has now been changed to include cooked vegetables, fish, meat, eggs or fruit, served alone or in varying combination.

Food Value.—Salads are extremely valuable as giving variety to the diet, especially when they are planned with proper relation to the rest of the meal. It can readily be seen that their cost is not great. The green salad plants—celery, endive, cress, cucumber, lettuce, onions romaine, with radishes and tomatoes—furnish the food basis. The salads also provide mineral salts and vitamins and furnish suitable roughage. All forms of salad dressing are high in food value, because of the easily assimilated fats which they contain in the form of cream, butter, olive oil, eggs, etc. Meat and fish salads contain a great deal of food value and should only be used as the principal dish of a meal. They are too heavy to serve as an additional course at dinner.

Essential Points to be Observed in Making Salads.—1. All materials for salads should be cold.

2. Greens should be fresh, crisp and thoroughly washed in cold water.

3. The combination of materials must be suitable and have some relation to the other parts of the meal.

4. Materials must be neatly cut, arranged and garnished.

5. The materials in the dressing must be well blended. The dressing should be neither too strong of oil nor of acid.

6. The salad materials and the dressing must be well mixed just before serving.

Classes of Salad Dressing.—1. *French dressing*, a combination of oil, vinegar or lemon juice and seasonings uncooked. Suitable to serve with vegetables and fruits.

2. *Cream dressing*, a cooked dressing made of milk or cream, vinegar and seasonings. Suitable to serve with any kind of salad.

3. *Mayonnaise*, an uncooked dressing made of oil and yolks of eggs for a foundation and seasonings and acid added as desired. Best for use with meat and fish salads, although it may be used with any combination.

To Serve with Salads.—Crisp toasted crackers; crisp toasted cheese crackers; cheese straws; cheese balls; small sandwiches of white, rye, brown or nut bread.

SALADS AND SALAD DRESSINGS.

French Dressing.

½ teaspoonful of salt; 2 tablespoonfuls of vinegar; 4 tablespoonfuls of olive oil; ¼ teaspoonful of pepper or cayenne to taste.

Blend the ingredients by beating with a silver fork in a salad bowl, or shake together in a bottle when dressing is not prepared at the table. Other seasonings may be added as desired.

Almond Salad Dressing.

4 egg yolks, beaten stiff; 4 egg whites, beaten light; 1 cup of powdered sugar; ½ teaspoonful of salt; juice of 2 lemons; ½ cup of whipped cream.

Separate eggs; beat, add sugar and continue beating; add salt and lemon juice. Cook in a double boiler until thick.

Chill and add whipped cream and ¼ teaspoonful of almond flavoring just before serving. This is to be served on fruit salads.

Boiled Dressing.

1 teaspoonful of mustard; 1 teaspoonful of salt; 2 teaspoonfuls of flour; ½ cup of milk; 1½ teaspoonfuls of sugar; 1 teaspoonful of melted butter; 1 egg; ⅓ cup of hot vinegar.

Mix dry ingredients; add butter, egg and vinegar slowly. Cook in a double boiler until the mixture begins to thicken. Add milk and cook until thick. Add butter last. Beat with a Dover beater to prevent curdling.

Mayonnaise Dressing.

1 egg yolk; 2 tablespoonfuls of lemon juice or vinegar; few grains of cayenne; 1 pint of olive oil; ¼ teaspoonful of salt.

Beat egg yolks with silver fork on a plate; add salt and a few drops of lemon juice or vinegar. Add oil gradually, drop by drop, at first and stir constantly. As the mixture thickens, thin with lemon juice or vinegar. Add oil and acid alternately until all is used, stirring constantly. Ingredients must be well chilled and the dressing made in a cool place or the salad plate placed over a bowl of cracked ice.

Fruit Salad.

1 can pineapple; 1 large stem malaga grapes; ½ cup of walnuts; 1 orange; 1½ cups of white cherries.

Pile fruit lightly in lettuce cup.

Swiss Salad.

1 cup of cold chicken in cubes; 1 cup of cucumber cubes; 1 cup of English walnuts; 1 cup of French peas.

Marinate with French dressing. Serve with mayonnaise in crisp lettuce leaves.

Cress Salad.

Mix water-cress with an equal quantity of chopped celery and serve with French dressing or mayonnaise.

Vegetable Salad.

Mix crisp lettuce or endive with sliced tomatoes, cucumbers, green peppers and celery cut finely. French dressing may be used.

CHAPTER XX.

FLOUR MIXTURES.

Digestibility.—Twice-cooked breads, as zwieback or toast, are dextrinized and therefore more available forms of food than fresh bread. However, there are occasions when the digestion is not impaired and some of the following recipes may be used:

Toast.—Toast should be served as hot as possible. It is rendered less digestible by buttering before it is served. The fat penetrates the food material, and having been melted and cooled, will probably solidify again before being eaten. Both bread and butter thus become more difficult of digestion.

Flour Mixtures.—Flour mixtures are combinations of flour with some liquid. Some kind of a leavening agent is always added, and usually one or more of the following materials: sugar, shortening, egg, fruit or nuts. These last named materials are added to make the mixture richer or to give it flavor. Flour mixtures are divided into the following classes, depending upon the proportions of flour and liquid used:

Batter.—1. *Pour-batter* contains 1 measure of flour to 1 measure of liquid. Examples: popovers.

2. *Drop-batter* contains about 2 measures of flour to 1 of liquid. Example: muffins.

Dough.—1. *Soft dough* contains about $2\frac{2}{3}$ measures of flour to 1 measure of liquid. Example: baking powder biscuits.

2. *Stiff dough* contains 3 or more measures of flour to 1 of liquid. Example: bread.

Leavening Agents.—There are three classes of leavening agents:

1. *Air:* introduced into flour mixtures by beating or by beating eggs and adding them to the mixture to be beaten.

2. *Steam:* heat of the oven changes the liquid in the mixture to steam. This expands and makes the mixture light, although the expansion is limited by the crust which forms on the outside.

3. *Carbon-dioxide gas:* this is produced by:

(*a*) The use of soda with an acid, as in sour milk or cream of tartar. Baking powder contains 1 part of soda to 2 parts of cream of tartar and a little cornstarch to take up moisture and keep the powder dry.

(*b*) Yeast.

Flour.—There are two kinds of white flour: that made from spring wheat, and called bread flour, and that made from winter wheat, and called pastry or cake flour. The former is rich in gluten, which gives it elasticity and makes it the best for bread-making. The latter contains a higher percentage of starch, so that it is lighter and more suitable for cakes and pastry.

Besides the white flours there are coarse flours, their quality depending upon the process of milling and the number of bran coats not removed. Graham and entire wheat flour are richer in protein and ash constituents than any of the white flours. While authorities differ upon the relative food value of coarse and fine flours, it is certain that dark flours, because of their larger bulk, are a very valuable addition to the diet of people of sedentary habits.

Oven Tests.—1. Heat may be tested by an oven thermometer.

2. Heat may be tested by placing a hand in the oven and counting eight for very hot, ten for hot, twelve for moderate and sixteen for slow, referring to the limit of heat endurance.

3. A very hot oven is one in which a piece of white paper turns brown in three minutes.

All small hot breads require a hot oven. Large cakes and breads require a moderate oven.

To Test Complete Baking.—1. The material shrinks from the side of the pan.

2. No depression is left after pressure with the finger.

Baking Powder Biscuits.

1 cup of flour; $\frac{1}{4}$ teaspoonful of salt; $\frac{1}{2}$ cup of milk or water; 2 teaspoonfuls of baking powder; 1 tablespoonful of butter.

Sift the dry ingredients; chop the butter in with two knives; add the liquid gradually; put the dough on lightly floured board; pat gently into round cake; roll out, keeping dough as soft as possible, to 1 inch of thickness. Cut with biscuit cutter; put on shallow tin. Bake for about thirty minutes.

Popovers.

1 cup of flour; 2 eggs; 1 cup of milk; $\frac{1}{8}$ teaspoonful of salt.

Beat eggs very light; add milk and the sifted dry ingredients, beating constantly. Bake in hot well-greased gem pans in a hot oven for fifteen to twenty minutes.

Shortcake.

2 cups of flour; 1 teaspoonful of salt; 2 tablespoonfuls of butter; 4 teaspoonfuls of baking powder; $\frac{1}{2}$ cup of sugar; $\frac{3}{4}$ cup of milk; 1 quart of berries.

Sift the dry ingredients. Cut in the butter. Add fluid. Bake for thirty minutes.

Nut Bread.

1 egg; ½ teaspoonful of salt; 4 teaspoonfuls of baking powder; 1 cup of nuts; ½ cup of sugar; 1 cup of milk; 3 cups of flour.

Cream the egg and sugar. Add the milk; add flour sifted with dry ingredients and bake in a moderate oven for forty-five minutes. This recipe may be made salt-free for one on a salt-free diet.

Health Bread.

2 eggs; ½ cup of molasses; ½ cup of sugar; 1 cup of cornmeal; 2 teaspoonfuls of baking powder in flour; ½ cup of walnuts; 2 cups of milk; ½ teaspoonful of soda in molasses; 1½ cups of bran; 3½ cups of white flour; ½ cup of raisins or figs.

Beat the eggs and add other ingredients; mix well. Bake in two loaves in moderate oven for forty-five to sixty minutes.

Bran Muffins.

4½ cups of bran; ¾ teaspoonful of soda; 3 eggs; 1½ teaspoonfuls of salt; 1½ cups of buttermilk.

Bake in one dozen muffin tins; press down well in tins and bake in moderate oven for thirty minutes.

Bran Bread.

4 cups of sour milk; 1 cup of molasses; 3 teaspoonfuls of salt; 3 level teaspoonfuls of soda; ½ cup of sugar (or more).

Mix above thoroughly.

3 cups of bran; 3 teaspoonfuls of baking powder; 5 cups of graham or wheat flour.

Mix and add to the first mixture.

Add raisins, figs, dates, nuts, etc., as desired. This should make three loaves. Bake slowly with, at first, a hot oven, from forty-five to sixty minutes.

CHAPTER XXI.

CAKE.

Classification.—Cakes are of two kinds:

1. Cakes made on an egg foundation. These alone are used in invalid cookery. They include sponge cake, sunshine cake, angel cake and lady-fingers.

2. Cakes containing butter or some other fat. Examples are cup cake and pound cake.

Success in cake-making is conditioned upon the following precautions:

1. Use only the best materials and pastry flour, if possible.

2. Measure accurately.

3. Have a uniform heat for baking: a slow oven for sponge cakes; a moderate oven for loaf cakes and a quick oven for cup cakes and layer cakes.

4. Grease tins thoroughly for butter cakes; do not grease tins for sponge cakes; and keep separate tins for sponge cakes, if possible.

5. Be careful to watch the cakes during baking.

How to Tell When a Cake is Cooked.—1. Insert a toothpick or knitting needle; if it comes out clean and dry, the cake is done.

2. Press the cake gently with your finger; if it springs back into place and does not leave a dent it is done.

3. When the cake shrinks from the side of the pan it is done.

The Four Stages of Cake-baking.—1. In first quarter of baking the cake begins to rise.

2. In second quarter of baking the cake continues to rise and begins to brown.

3. In third quarter of baking the cake continues to brown.

4. In fourth quarter of baking the cake shrinks from pan.

The Care of Cake after Baking.—1. Remove it at once from the pan to a board or table, covered with a clean cloth.

2. If the cake sticks to the pan, invert it and cover the bottom with a damp cloth. The cake will steam out.

3. Let cake cool thoroughly before putting on frosting. In invalid cookery only sponge cakes are used.

Flour.—Pastry flour is recommended in cake-making. If it cannot be secured, substitute 2 tablespoonfuls of cornstarch for 2 tablespoonfuls of flour in each cup of flour called for in the recipe.

Sponge Cake.

6 eggs; 1 cup of sugar; 1 tablespoonful of lemon juice; 1 tablespoonful of orange juice; $\frac{1}{8}$ teaspoonful of salt; grated rind of $\frac{1}{2}$ lemon; 1 cup of flour.

Beat the eggs until thick and lemon colored; add sugar and continue beating. Use a Dover beater. Add lemon rind and fruit juice. Cut and fold in flour mixed and sifted with salt. Bake forty-five minutes in a slow oven. Remove from pan immediately the cake is baked.

Hot Water Sponge Cake.

Yolks of 2 eggs; 1 cup of sugar; $\frac{3}{8}$ cup of hot milk or water; $\frac{1}{4}$ teaspoonful of lemon extract; whites of 2 eggs; 1 cup of flour; $1\frac{1}{2}$ teaspoonfuls of baking powder; $\frac{1}{8}$ teaspoonful of salt.

Sift the sugar. Beat the yolks until thick and lemon colored. Add half of the sugar gradually; continue beating. Then add water, the remaining sugar, lemon extract, whites of eggs beaten until stiff, and flour, mixed and sifted four

times, with baking powder and salt. Bake for twenty-five minutes in moderate oven, in a buttered and floured shallow pan.

Lady-fingers.

4 eggs; ½ cup of powdered sugar; 1 cup of flour; 1 teaspoonful of vanilla.

Mix as for any sponge cake and press through a tube on a baking sheet covered with two thicknesses of paper. Make cakes 5″ x 1″ in size. Dust with powdered sugar. Bake for ten to fifteen minutes, in a moderate oven, without browning. When cool remove from paper and brush over the flat surface with slightly beaten white of egg and put together.

Angel Food.

1 cup of whites of eggs (about 10); 1 cup of fine granulated or fine powdered sugar; 1 cup of flour; ½ teaspoonful of cream of tartar; 1 teaspoonful of flavoring.

Sift the flour six times. Also sift the sugar six times. Beat whites until foamy. Sprinkle in cream of tartar and beat until dry. At this stage beat in ⅓ of the sugar then fold in the rest. The beating should be continued until the mixture is stiff, but still retains its foamy character. Then sprinkle flavoring over it and fold in flour. Bake in new unbuttered tin. Put in a hot oven, then decrease heat. Bake for thirty to fifty minutes.

Sunshine Cake.

Whites of 7 eggs; yolks of 5 eggs; 1 cup of sugar (granulated or powdered); ⅔ cup of flour; 1 teaspoonful of orange extract or 2 teaspoonfuls of orange juice; a few drops of lemon juice; ⅓ teaspoonful of cream of tartar.

Sift the sugar four times. Also sift the flour four times. Beat the yolks until thick and creamy. Beat the whites until foamy and add the cream of tartar and beat until dry. Meanwhile sprinkle half of the sugar into the whites, beating but not losing the puffy appearance. Fold in the rest of the sugar; slowly pour the yolks on the whites and mix by folding. Add flavoring. Fold in flour. Bake in an unbuttered pan for thirty-five to fifty minutes.

Nut Wafers.

2 eggs; 1 cup of brown sugar; 1 cup of walnuts, chopped; ½ cup of flour; ⅛ teaspoonful of salt.

Beat the eggs, add the sugar and then the flour. Mix well and drop on inverted tins (buttered) from tip of teaspoon. Bake in a quick oven for ten minutes.

Fruit Cookies.

1 cup of sugar; 2 eggs; ½ teaspoonful of soda; ½ cup of sweet milk; 1 teaspoonful of cloves; 1 teaspoonful of cinnamon; 1½ cups of flour; 1 cup of raisins; ½ cup of butter.

Cream the butter; add the sugar and then the beaten eggs. Add the milk and then the sifted dry ingredients. Add the raisins last, and bake in a quick oven for ten minutes.

Cocoanut Puffs.

Whites of 2 eggs; 1 tablespoonful of cornstarch; 1 cup of confectioners' sugar; 1 tablespoonful of cream of tartar; 2 cups of cocoanut.

Beat the eggs very stiff. Sift the sugar, cornstarch and cream of tartar in gradually, beating all the time. Stir in the cocoanut. Drop on buttered tins. Bake for fifteen minutes in a very hot oven.

Marshmallow Frosting.

½ pound marshmallows; 1 cup of sugar; white of 1 egg; ¼ cup of water.

Stand the marshmallows in the oven until they run together. Beat slowly into the egg. Make a syrup and add to the paste.

White Frosting.

White of 1 egg; 1 cup of sugar; 4 tablespoonfuls of cold water.

Put all together in a double boiler and boil seven minutes; stir constantly and continue to stir after removing from fire until it begins to thicken, and then spread.

CHAPTER XXII.

MEAT.

Definition.—Meat is the flesh of animals used for food. The term is usually understood to include poultry and game.

Physical Structure.—All meats have practically the same physical structure; that is, bone, cartilage, skin, connective tissue, muscular tissue, fat and juices. Different kinds of meat and different cuts from the same animal differ only in the arrangement of these physical parts. For example, the muscle fibers of beef and mutton are long and loosely connected, while those of pork and veal are short and compact.

Protein Constituents of Meat.—These nitrogenous compounds may be classified as:

Albumins and myosin, making up the lean part or flesh of the meat; collagen of connective tissue; and the ossein of bone, which yields gelatin.

Nitrogenous extractives: a group of compounds which are soluble in water. These include urea and creatin, and are the chief ingredients in beef tea.

EXPLANATION OF FIG. 2.

BEEF CUTS

A–A.—Portion above this line is the hind quarter, while that below is the fore quarter.

FORE QUARTER

1. *Neck*
2. *Whole Chuck*
   1. 5th rib roast
   2. Chuck steaks
   3. Pot roast
   4. Clod
3. *Fore Shank*
4. *Brisket*
5. *Plate*
   1. Navel
   2. Rib ends
6. *Rib*
   1. 11th and 12th rib roast
   2. 9th and 10th rib roast
   3. 7th and 8th rib roast
   4. 6th rib roast

HIND QUARTER

7. *Flank*
   1. Flank steak
   2. Stew
8. *Loin*
   1. Butt end sirloin
   2. Wedge bone sirloin
   3. Round bone sirloin
   4–5. Flat bone steaks
   6. Pin bone steak
   7–15. Porterhouse
   16–18. Club steaks
9. *Rump*
10. *Round*
    1. First cut round steak
    2–13. Round steaks
    14. Knuckle soup bone
    15. Pot roast
11. *Hind Shank*
    16–17. Soup bones
    18. Soup bone

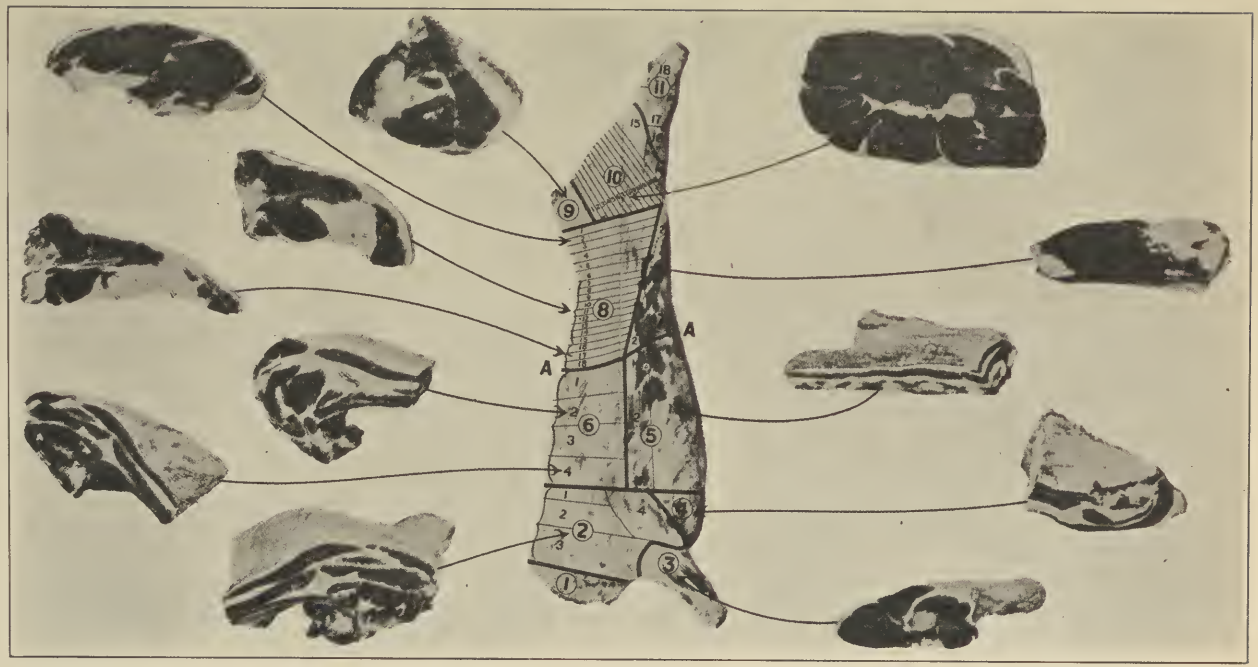

FIG. 2

Protein foods are essential constituents of the diet. Except in such fat meats as pork or bacon, the protein content of meat averages 20 per cent.

Mineral Content of Meat.—Meat is rich in phosphorus and iron, calcium, sulphur and sodium.

Food Value.—Meat is economically the most important of the protein foods. The food value of meat depends upon the following points:

1. The kind of meat: chicken, for instance, is more easily digested than beef, because of its structure.

2. The cut of meat: the tender cuts from those portions of the animal little used are more digestible than the coarser cuts.

3. The care and feeding of the animal: underfed animals are poorly nourished and their meat lacks in nutritive value.

4. The method of cooking: tender cuts are cooked in dry heat to retain the juices; coarser cuts in moist heat to break down the connective tissue.

Tests for Good Meat.—The lean part of good meat is firm, elastic, bright red and moist when exposed to the air. The tender cuts are fine-grained and finely marbled with fat. The fat is firm and of light straw-color, excepting around the kidney, where it is white and crumbly. Flabby, dark or coarse-grained meat with deep yellow fat indicates an old, underfed animal.

Care of Meat in the Home.—1. Remove meat at once from the paper container to a clean platter or board. Paper absorbs the meat juices.

2. Keep it in a cool place until ready for use.

3. Wipe the meat with a clean cloth wrung out in cold water before cooking.

Methods of Cooking Meat.—Meats are cooked in the following ways, depending upon the object to be attained.

1. To retain the juices, use tender cuts, as in broiling, baking and roasting.

2. To extract some of the juices and retain some, use the less tender cuts. Example: The rump.

3. To extract the juices, use the tough cuts or shank, as in the making of soups, broth or beef tea.

Beef Juice.

Select a piece of meat from the rump or upper part of the round. Cut into cubes about 2 inches square. Broil or warm slightly for one or two minutes, to set free the juices; then squeeze out juices by means of a press or lemon squeezer or potato ricer into a slightly warmed cup. Salt if necessary and serve at once. Serve in dainty china cups or in colored glasses to disguise the color of the juice.

Beef Essence.

Put half a pound of round steak, freed from fat, etc., through a meat grinder; put it into a glass fruit jar with one tablespoonful of cold water. Place the jar in a kettle of cold water. Heat gradually and keep at temperature of 150° F. for two hours. Strain and press the meat to obtain juice. Season with salt and serve immediately, or place on ice, where it will remain fresh for at least twelve hours.

Note.—A small piece of raw beef, broiled slightly and then cut up and added to the above, improves the flavor.

Scraped Beef.

Cut a strip of sirloin or round steak half an inch wide. Lay it on a meat board and with a sharp knife scrape off the soft part until there is nothing left but the tough fiber. Sca-

son this pulp with salt and pepper. This may be used for making sandwiches or may be shaped into tiny balls or small flat cakes and pan-broiled with fat for two minutes, merely running a piece of suet over the pan to prevent the cakes from sticking.

Beef Broth.

2 pounds of lean beef; 1 quart of cold water; ½ teaspoonful of salt; pepper to taste.

Wipe the meat, remove the skin and fat and cut the meat into small pieces. Put into a kettle with bones, add cold water and let it stand for two hours. Heat gradually to the boiling point and let it simmer for two to four hours. Do not allow it to boil. Season about half an hour before removing from the fire. Remove the fat by skimming through a cloth wet in cold water, or, better, by cooling the broth and letting the fat rise to the top, when it is easily removed.

Roast Beef.

Put the roast in a hot roasting pan. After the outside has been seared (ten minutes), season with salt and pepper. Baste about every fifteen minutes, cooking it for fifteen minutes to each pound. Cook a small roast rare.

Broiled Steak.

Wipe off and trim off superfluous fat. Heat the broiler very hot; rub it with a bit of fat and put in the steak. Have the broiler close to the fire at first; turn twice in the first few minutes; remove to a greater distance from the fire; turn about six times. Eight to ten minutes are required to cook a rare steak. Garnish with slices of lemon, watercress or parsley. Maitre d'hôtel butter may be spread upon steak. Sprinkle with salt when fully cooked.

Maitre d'Hôtel Butter.

¼ cup of butter; ½ teaspoonful of salt; ⅛ teaspoonful of pepper; ½ tablespoonful of finely chopped parsley; ¾ tablespoonful of lemon juice.

Put the butter in a bowl and with a small wooden spoon work until creamy. Add salt, pepper and parsley, and then lemon juice very slowly.

Chops.

Wipe and trim off superfluous fat. The small flank ends of loin chops may be cut off for the soup kettle or skewered around the rest of the chop. Bones of rib chops should be trimmed to uniform length; then scraped clean down to the eye of the meat. Cover bone with paper frill before serving. Mutton chops may be broiled the same length of time as for a rare steak. Lamb chops should be well done. Broil ten minutes for ordinary chop.

Broiled Bacon.

Place thin slices of bacon (from which rind has been removed) closely together in a fine wire broiler; place broiler over a dripping-pan and bake in a hot oven until bacon is crisp and brown, turning once. Drain on brown paper.

Pan-broiled Bacon.

Place thin slices of bacon in a sauteing pan. Cook until crisp and brown, occasionally pouring off fat, and turning bacon frequently. Drain on brown paper.

CHAPTER XXIII.

FISH.

Fish ranks next in value to meat among the protein foods. It is usually easier of digestion and contains fewer extractives. This renders it a better food than meat for people taking little exercise. It has a high content of gelatin, which is lost if the fish is boiled. Therefore, it is better to cook it by means of dry heat.

Selection.—Its freshness is the most important quality to be considered. The following points indicate freshness: firmness of flesh; brightness of eye; redness of gills; absence of unpleasant odor.

To Prepare Fish for Cooking.—1. Even if cleaned well at the market, it should be wiped off thoroughly, both inside and out.

2. If the fish has not been scaled, scales are to be removed by working a knife over the fish, beginning at the tail and scaling toward the head.

3. If the fish is to be cooked whole the head and tail may be left on.

4. To remove the skin from a fish, slit the skin along the entire length of the backbone. Remove the fins. Then loosen the skin carefully with a small knife, working from the backbone, around one side at a time.

5. To remove the bones from a fish: after the skin is removed, begin at the tail and separate the flesh from the backbone on each side. Follow the ribs and work carefully toward the head. The entire backbone and ribs will come out together.

Methods of Cooking.—Broiling and baking are the most desirable methods of cooking fish.

Large fish may be planked or stuffed whole. Small fish are best broiled or sauted.

Baked Haddock with Stuffing.

Clean a 4-pound haddock; sprinkle with salt inside and out; stuff and sew. Cut diagonal gashes on each side of the backbone and insert narrow strips of fat salt pork or bacon. Shape with skewers in the form of a letter S. Place on greased fish-sheet or on strips of cotton cloth in a dripping pan; sprinkle with salt and pepper. Bake for about one hour in hot oven, basting every ten minutes. Serve with drawn butter, egg, or Hollandaise sauce.

Fish Stuffing.

$\frac{1}{2}$ cup of cracker crumbs; $\frac{1}{2}$ cup of stale bread crumbs; $\frac{1}{4}$ teaspoonful of salt; few drops onion juice; $\frac{1}{4}$ cup of melted butter; $\frac{1}{4}$ cup of hot water; $\frac{1}{8}$ teaspoonful of pepper.

Mix in order given.

Fried Fillet of Halibut.

Clean the fish and cut in a long or short fillet. A fillet is a piece of fish freed from skin and bones. Roll if long and fasten with small wooden skewers or toothpicks. Sprinkle the fillet with salt and pepper; dip in egg and bread crumbs; saute and drain on brown paper. Serve with sauce tartar.

Pigs in Blankets.

Season large oysters with salt and pepper; roll each tightly in a slice of bacon; fasten with toothpicks. Saute in hot omelet pan until the bacon is clear. Serve on triangles of toast with sauce, brown or tomato.

Planked White Fish.

Shad or white fish are the two common fish planked. Clean and split a 3-pound shad; put skin side down on a plank one inch thick and a little wider than the fish. Sprinkle with salt and pepper; brush with butter. Bake twenty-five minutes in a hot oven. Remove from the oven, spread with parsley and lemon and serve fish on plank. Planked shad can be cooked in a gas range, having the flame over fish, or, in other words, broiled. Planked white fish of the Great Lakes has a high reputation.

Garnishes.

Lemon, parsley, tomato, tart sauces, hard-cooked eggs, cubed vegetables, water-cress, capers, nasturtiums, toast, shredded lettuce, potato roses, potato riced, potato balls and radishes.

Horseradish Sauce.

4 tablespoonfuls of horseradish; 1 teaspoonful of powdered sugar; ½ teaspoonful of salt; ½ cup of hot cream or white sauce; 4 tablespoonfuls of bread crumbs; 2 tablespoonfuls of vinegar; ½ teaspoonful of mustard (smoothed in water).

Mix all the ingredients excepting the cream or white sauce. Cook in the top of a double boiler for five minutes. Just before serving add the cream or the white sauce.

Tartar Sauce.

1 teaspoonful of lemon juice; 1 tablespoonful of Worcestershire sauce; 2 tablespoonfuls of butter; ¼ teaspoonful of salt; 1 tablespoonful of vinegar.

Heat these all together in a bowl over hot water. Brown some butter in a frying pan and strain it into the mixture.

CHAPTER XXIV.

POULTRY.

Poultry is the name given to all domestic birds used for food. This term includes: chicken, fowl, turkey, duck and goose. Chicken is the only one used to any extent in the diet of the sick.

Selection.—Poultry one year old, or younger, is called chicken; over one year, fowl. Chickens weighing about one and one-half pounds are broilers. Young chickens have a smooth skin, soft feet, a large number of pin feathers, and the breast bone cartilage is soft and flexible. Fowl have scaly feet, long hairs, rigid breast bones and much fat around the internal organs.

Digestibility.—The muscle fiber or flesh of poultry contains little fat. The fibers are also shorter than the fibers of mutton and beef. This makes them tender and easily digested. The white meat of chicken contains less fat and less connective tissue than the dark meat, and so it is more easily digested.

Preparation.—1. Poultry should be dressed as soon as killed; the feathers come off more easily at that time.

2. The pin feathers may be removed with a sharp knife.

3. Singe the hairs, if any, by holding over a burning paper.

4. Cut off the head and feet.

5. Turn down the skin of the neck and cut off the neck close to the body; remove the crop and windpipe from the end of the neck.

6. Remove the tendons in the legs, one at a time, being careful not to tear the flesh.

7. Remove the oil bag from the tail.

8. Remove the internal organs carefully, being careful not to break the gall-bladder, which is attached to the liver and must be cut away without breaking. The lungs and kidneys lie in the hollow of the backbone and must be removed. Save the liver, the gizzard and the heart; these are called giblets, and are used in making dressing or gravy. Throw everything else away.

9. When everything has been removed, wash the bird carefully inside and out and wipe dry with a clean cloth.

To Prepare Giblets for Cooking.—1. Press the heart to extract the blood and cut it open.

2. Remove the gall-bladder carefully from the liver.

3. Cut through the thick muscles of the gizzard and peel them off slowly without breaking through the inside lining.

4. Put them into cold salted water until ready for use.

5. When ready to cook, put the heart and the gizzard into cold water; heat quickly and cook at the simmering point until almost tender. Add the liver and cook until the giblets are tender. The liver does not require long cooking.

To Truss a Fowl.—1. Draw the legs close to the body and either skewer them to or tie them to the tail.

2. Put another skewer through the wings and breast.

To Cut a Fowl for Frying or Stewing.—1. Cut off the legs. Separate them at the joint between the drumstick and the second joint.

2. Cut off the wings and remove the tip of each.

3. Separate the wishbone with the meat on it from the breast.

4. Cut through the ribs on each side and separate the breast from the back. Cut through the breast in the center lengthwise and then the back through the center crosswise.

5. There should be 12 pieces.

Roast Chicken.

Put a 4-pound bird on the rack in a roaster. Rub its surface with salt and spread upon the breast and legs 3 tablespoonfuls of butter creamed with 2 tablespoonfuls of flour. Roast in a hot oven, basting every ten minutes, until done. Use 2 tablespoonfuls of butter, melted in $\frac{1}{2}$ cup of hot water, for basting until enough fat comes out into the pan. Turn the chicken frequently so that it will brown evenly on all sides. When the breast meat is tender the chicken is done. This takes about one and one-half hours.

Stuffing.

2 cups of bread crumbs; 2 tablespoonfuls of parsley (cut fine); 2 tablespoonfuls of celery (cut fine); 1 tablespoonful of onion (cut fine); $\frac{1}{2}$ cup of hot water; 2 tablespoonfuls of melted butter; $\frac{1}{2}$ teaspoonful of salt; $\frac{1}{8}$ teaspoonful of pepper; 1 egg.

Add seasonings to the bread crumbs. Then add the melted butter, hot water and egg, well-beaten.

Oyster Dressing.

Add 1 pint chopped oysters, cleaned and drained, to above recipe.

Broiled Chicken.

Chicken for broiling should not weigh over $1\frac{1}{2}$ pounds.

Split the broiler down the back. Break the joints; remove breast bone; clean and wipe well with a dry cloth. Season with salt and pepper and rub well with creamed butter. Put into hot broiler and broil for twenty minutes. Garnish with parsley and slices of lemon.

Squabs.

Singe the birds and make an incision, the length of the bird, down the backbone. Remove the contents and cut out small rib bones; cut through tendons at joints. Wash well and season. Spread the birds flat open on wire broiler and broil for ten minutes, turning four times. Garnish with parsley.

Mock Fried.

Use a spring chicken or capon. Parboil or steam until tender, then season; roll in flour or bread crumbs and saute until tender.

Chicken a la Maryland.

Cut in pieces; dust with salt, pepper and flour and sprinkle with lemon juice. Sprinkle with sliced onion, broken bay leaf and clover. Put some in the bottom of the pan also. Spread the chicken with butter or cover with thin slices of salt pork or bacon, held by toothpicks. Cover the pan tightly and cook for half an hour in a very hot oven. Cook the giblets separately in water and when soft, season. Mash and spread on toast. If the toast is hard, pour a little strained liquid from the giblets over it. Serve the chicken on these slices, garnish with parsley, serve with sauce made from the liquid in the pan and the giblet water. Season with onion, Worcestershire sauce or tomato, or a highly-seasoned tomato sauce.

Jellied Chicken.

Clean and cut up a 4-pound fowl. Cover with boiling water. Cook slowly until the meat falls from the bones, adding 1 teaspoonful of salt when half-cooked. Remove the meat from the bones. Pick the meat apart and mix the light and the dark, or use only the light if desired. Remove fat

from the chicken liquor; season it highly with salt, pepper and lemon juice. Cook slowly to reduce the broth to about one cupful. Butter a mold and pack the meat in solidly. Turn in the seasoned broth. Set it aside to cool. When ready to serve, dip the mold into warm water and turn out carefully. The chicken may be molded in individual molds and used cold in place of meat or salad. In hot weather it may be necessary to add 1 teaspoonful of gelatin soaked in 1 tablespoonful of cold water to be sure the chicken loaf will be stiff enough to slice.

Chicken Broth.

One medium sized fowl; 2 quarts of water.

Cut up the fowl as for stewing. Add the water, salt, white pepper, and, if desired, a little chopped onion or celery or both. Cook slowly for about five hours. Remove the meat and let the broth cool. When cold remove the extra fat. Put into glass jars and keep in a cool place until ready to use. If stock is not to be used at once, the fat may be left on. This makes an air-tight covering and helps to keep the stock fresh.

CHAPTER XXV.

MODIFIED RECIPES FOR CASES REQUIRING SPECIAL DIETARY CONSIDERATIONS.

Modification of Recipes.—Rather than change the recipe until the product has lost its identity, it is preferable to modify the menu and eliminate such foodstuffs as are undesirable. Special diet cookery requires individualizing and rearranging of menus to satisfy the diet requirements of the various cases.

For certain conditions such as diabetes, an effort has been made to contribute variety to the necessarily limited diet by the modification of recipes. An effort should be made to select food materials which are not dangerous to the patient and build up a combination of foods that represents as nearly as possible a normal meal. This requires ingenuity on the part of the nurse.

Diabetic Cookery.—The problem in cooking for the diabetic is to keep within the individual's carbohydrate limit and still to supply sufficient bulk of food so that the hunger will be satisfied. Such materials as bran, cellulose or agar-agar are valuable in that they are not absorbed and provide the diet with bulky material.

Materials can be selected for diabetic cookery that have no food value as mineral oil for fats and agar for eggs, to bind other foodstuffs and coffee as a flavoring agent. It is possible to train a patient's taste away from sugar. If there is too great a craving for sweets, saccharin can be substituted for sugar, 1 grain being sufficient to sweeten 1 quart of food.

Soups.

Any meat soup may be used, or unthickened vegetable cream soups.

Cream of Asparagus Soup.[1]

(P. 25, F. 164, C. 26.)

1½ cups asparagus puree; ¼ teaspoonful of salt; ½ cup of water; 1 pint of cream.

Add the puree and water to scalded cream. Stir well before serving, as the asparagus is lighter than the liquid.

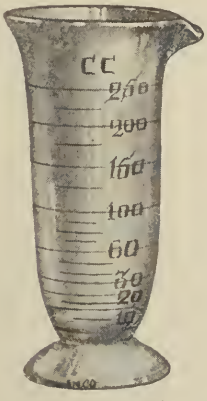

Fig. 4.—The standard graduate.

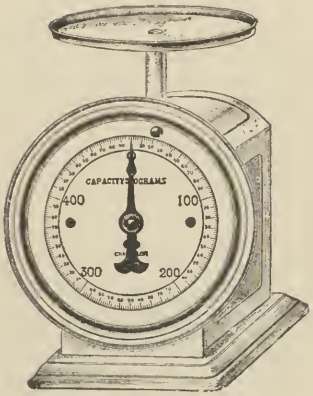

Fig. 5.—The gram scale.

Cream of Celery Soup.

(P. 24, F. 164, C. 25.)

2 cups of diced celery; 1 pint of water; ½ teaspoonful of salt; 1 pint of cream.

Cook celery until tender. Add hot water and cream.

[1] The food value of these recipes has been calculated in grams.

Vegetables.

Select vegetables from the 5 to 10 per cent carbohydrate group whenever possible.

Brussels Sprouts.

Pick over; remove any wilted leaves and soak in cold water twenty minutes. Cook in boiling salted water twenty minutes. Drain and serve with melted butter.

Cauliflower.

Cauliflower is somewhat similar to Brussels sprouts. Remove the leaves, cut off the stalks and soak twenty minutes, head down, in cold water to cover. Cook, head up, in boiling salted water for twenty minutes. Drain and serve with Hollandaise sauce.

Boiled Cucumber.

Old cucumbers may be pared, cut in dice, cooked until tender in salted water. Mash and season with butter, salt and pepper.

Mushrooms.

Mushrooms may be sauted in butter, or the cap may be stuffed with parsley and onion, chopped fine, before sauteing.

Dandelions.

Wash well, remove roots. Cook until tender in boiling salted water. Allow 2 quarts of water to each peck of greens. Season with butter, salt, pepper and vinegar.

Scalloped Egg-plant.

(P. 14, F. 22, C. 5.5.)

Pare the egg-plant (400 grams), cut into cubes and cook in boiling water until tender. Cook 2 tablespoonfuls of butter with $\frac{1}{2}$ onion until brown, add 1 tablespoonful of chopped parsley and the egg-plant. Turn into buttered baker and bake for twenty minutes.

Asparagus Loaf.

(P. 29, F. 70, C. 11.)

1 cup of asparagus tips; $\frac{2}{3}$ cup of cream; 3 eggs.

Cut asparagus into 1-inch lengths. Mix with eggs and cream. Bake in custard cups like custard. This will make about six servings.

Stuffed Tomatoes.

(P. 25, F. 51, C. 53.)

Wipe and remove slices from stem ends of 6 medium-sized tomatoes. Take out seeds and pulp; sprinkle inside with salt and stand them inverted for one hour. Cook for five minutes 2 tablespoonfuls of butter and 1 tablespoonful of onion. Add $\frac{1}{2}$ cupful of chopped cold chicken, $\frac{1}{4}$ cup of bran. Cook for five minutes. Add 1 egg, slightly beaten and refill tomatoes. Bake for twenty minutes.

Green Peppers.

(P. 20, F. 36, C. 23.)

2 peppers; 1 tablespoonful of cheese; 2 tablespoonfuls of cream; 1 egg; 1 tablespoonful of chopped pepper.

Cut a slice from the blossom end of the pepper. Remove

all seeds. Parboil for ten minutes. Drain. Cut cheese fine, add to beaten egg, chopped pepper and cream. Before filling, stand the peppers in muffin tins or ramequins. Bake in a moderate oven for twenty minutes. Any meats may be used. Variety may be provided in their preparation.

Mosquitoes.

(P. 39, F. 136, C. 7.)

6 or 1 box sardines in mustard; 1 lemon; 6 slices of bacon.

Remove bones and mash fine with the juice of 1 lemon. Sprinkle thickly on slices of bacon. Roll up and fasten each with a toothpick. Brown in a hot pan. Butter bran crackers and sprinkle with grated cheese. Heat in the oven and serve a mosquito on each.

Baked Cod.

(P. 26, F. 13, C. 24.)

Lay slice of cod in a buttered baking pan. Season with salt and pepper. Place 1 slice of tomato and 1 large mushroom on each slice of fish. Add 1 teaspoonful of chopped onion. Dot with butter and squeeze lemon juice over all. Bake in a moderate oven for twenty minutes.

Minced Meat Français.

(P. 47, F. 100, C. 15.)

Equal parts of any cold meat and 1 green tomato. Chop fine, season with salt, pepper and 1 teaspoonful of chopped onion. Mix 2 eggs with 1 cupful of cream. Put 1 tablespoonful of butter in a hot pan. Cook the tomatoes until nearly done and add the onion and meat. Then turn the cream and eggs over all and cook for five minutes.

Any of the salad vegetables may be used with French or Mayonnaise dressing.

Springtime Salad.

(P. 39, F. 12, C. 11.)

2 tablespoonfuls of gelatin; ½ cup of cold water; ½ cup of vinegar; ½ grain of saccharin; 1 teaspoonful of salt; 2 cups of boiling water; ½ cup of celery; ¼ white hard-cooked egg; ¼ cup of asparagus tips; ¼ cup of chicken cut fine.

Dissolve gelatin in cold water; add boiling water, add acid and salt. When it is chilled and thick, add the remaining ingredients. Serve with Mayonnaise dressing.

Stuffed Celery.

1. Fill celery stalks with Springtime Salad mixture before it becomes firm. Chill and serve with French dressing.
2. Fill celery stalks with cream cheese.
3. Fill celery stalks with cream cheese, Mayonnaise and chopped pickle.

DESSERTS.

Gelatin, cream, milk, eggs and agar-agar form the foundation of many attractive desserts. These may be served with whipped cream and flavored with coffee or with the juice of the fruits having a low carbohydrate content.

Snow Pudding.

(P. 20, F. 0, C. 3.)

1 tablespoonful of gelatin; ¼ cup of cold water; ¼ cup of lemon juice; 1 cup of boiling water; 1 grain of saccharin; whites of 3 eggs.

Soak gelatin in cold water; dissolve in boiling water; add sugar and lemon juice. Chill until quite thick and then beat to a froth. Add whites of eggs, beaten stiff, and continue beating until stiff enough to hold its shape. Pile in serving dish and pour boiled custard over it.

Lemon Jelly.

(P. 10, F. 0, C. 3.)

2 tablespoonfuls of gelatin; ½ cup of cold water; 2½ cups of boiling water; 1 grain of saccharin; ½ cup of lemon juice.

Soak gelatin in cold water; dissolve in boiling water; add remaining ingredients. Strain, mold and chill.

Coffee Jelly.

(P. 31, F. 19, C. 24.)

2 tablespoonfuls of gelatin; ½ cup of cold water; 2 cups of hot milk; 1 cup of hot coffee; 1 grain of saccharin.

Combine as lemon jelly. Serve with whipped cream.

Junket.

(P. 31, F. 38, C. 49.)

1 quart of milk; 1 Junket tablet; 1 tablespoonful of cold water.

Crush Junket tablet. Heat milk until warm. Add Junket dissolved in cold water. Keep in warm place until firm. Chill. Serve with whipped cream.

Baked Custard.

(P. 72, F. 69, C. 49.)

1 quart of milk; ½ grain of saccharin; 6 eggs; ¼ teaspoonful of salt.

Beat the eggs and stir in dry ingredients; then the hot

milk. Pour into buttered molds. Set in a pan of hot water and bake in a moderate oven for twenty minutes.

Coffee Ice-cream.

(P. 52, F. 43, C. 48.)

1 quart of cream; $\frac{1}{3}$ cup of milk; $\frac{1}{2}$ tablespoonful of coffee infusion; $\frac{1}{4}$ grain of saccharin; $\frac{1}{4}$ teaspoonful of salt; yolk of 1 egg.

Scald the milk with coffee; add saccharin; mix the egg yolk slightly and salt. Combine the mixtures. Cook in top of the double boiler until thick. Add 1 cup of cream and allow to cool. Add remaining cream and freeze.

Mousse.

Beat heavy cream until stiff, flavor with coffee, nut meats or orange. Sweeten with saccharin; add a little salt and pour into the mold. Place mold in salt and ice, using 2 parts of ice to 1 part of salt, and allow to stand three hours.

Orange Agar Jelly.

(P. 1.5, F. .25, C. 21.)

One teaspoonful of agar dissolved in 4 teaspoonfuls of cold water. Add $\frac{3}{4}$ cupful of boiling orange juice.

Coffee Agar Jelly.

(P. 3, F. 13, C. 2.)

One teaspoonful of agar dissolved in 4 teaspoonfuls of cold water. Add $\frac{3}{4}$ cup of boiling water and 2 tablespoonfuls of chopped nut meats. Serve with whipped cream.

Cheese Rarebit.

(P. 13, F. 21, C. 6.)

1 tablespoonful of butter; $\frac{1}{4}$ teaspoonful of salt; cayenne; 1 egg; $\frac{1}{2}$ tablespoonful of cheese cut in pieces; $\frac{1}{4}$ teaspoonful of mustard; $\frac{1}{2}$ cup of milk.

Put the butter in a double boiler; when melted add cheese and seasonings and milk. Stir constantly. Add slightly beaten egg when cheese is smooth.

Cellu Bran Muffins.

80 grams of Cellu flour; 50 grams of dry washed bran; 10 grams of baking powder; hot water; 10 grams of India gum; 4 tablespoonfuls of mineral oil; salt.

Mix the dry ingredients thoroughly. Add the oil and saccharin dissolved in a small amount of water. Then add the hot water, using sufficient to make a mixture which can be easily molded. Place in muffin tins, greased with mineral oil or petroleum jelly. Bake in a very slow oven, increasing heat to brown the muffins. These muffins have practically no food value.

Cellu Bran Crackers.

$\frac{1}{2}$ cup of Cellu flour; 1 cup of dry washed bran; $\frac{1}{2}$ teaspoonful of salt; $\frac{1}{2}$ grain saccharin; 1 tablespoonful of India gum; 1 teaspoonful of baking powder; 3 tablespoonfuls of mineral oil; hot water.

Makes 12 crackers, about 4 inches by 4 inches and $\frac{1}{8}$ of an inch thick, resembling Graham crackers.

Mix all the dry ingredients. Add the mineral oil and saccharin dissolved in a small amount of water. Then add sufficient hot water to make a soft dough. Spread on a baking sheet or in flat baking pans and cut into 12 wafers.

Bake in a slow oven until dry. These crackers have practically no food value.

Bran Crackers.

(P. 6, F. 5, C. 0.)

4 cups of washed dry bran; $\frac{1}{4}$ cup of water; 1 teaspoonful of salt; 1 egg; $\frac{1}{2}$ teaspoonful of baking powder.

Combine and flatten mixture in greased pan to $\frac{1}{4}$ its thickness. Bake in hot oven.

Bran and Agar Cakes.

(P. 13, F. 10, C. 0.)

2 cups of wheat bran; $\frac{1}{2}$ teaspoonful of salt; 1 tablespoonful (10 grams) of agar-agar; 8 ounces of water; $\frac{1}{2}$ grain saccharin; 2 eggs.

Tie the bran in cheesecloth and soak for one hour. Squeeze out water and wring dry. Heat water with agar-agar until it is smooth. Stir while heating. Add this to the washed bran, salt and saccharin. Break the eggs and add without beating. Mix well. Take up by level tablespoonfuls and drop on well-buttered baking sheet. Bake for twenty-five minutes in a moderate oven. These are valuable cakes to use for those suffering with constipation. Two can be eaten at each meal, spread generously with butter.

Diabetic Bran Muffins.

(P. 12, F. 10.)

Bran, 1 cup; eggs, 2; salt, $\frac{1}{4}$ teaspoonful.

Wash bran thoroughly in a fine strainer until all starch is removed and water is clear. Wring thoroughly in a dry cloth.

Mix egg yolks, salt and bran very carefully. Beat egg whites stiff and fold into the mixture. Divide into 6 muffins and bake in iron muffin pans, buttered with liquid petrolatum, for twenty minutes in a slow oven.

Bran Muffins, No. 1.

(P. 27, F. 16, C. 11.)

Bran, 8 cups; Cellu flour, 2 tablespoonfuls; agar-agar, 3 tablespoonfuls; water, 1½ cups; sour milk, 1 cup; soda, 1 level teaspoonful; saccharin, 1½ grain; salt, 1 teaspoonful; eggs, 3.

Wash bran. Add Cellu flour. Dissolve agar in water. When thoroughly dissolved, add sour milk and saccharin. Add soda to agar and milk and beat. Add bran. Add unbeaten eggs last.

Bran Muffins, No. 2.

(P. 27, F. 16, C. 11.)

Bran, 8 cups; agar-agar, 6 tablespoonfuls; water, 1½ cups; sour milk, 1 cup; soda, 1 teaspoonful; saccharin, 1½ grain; salt, 1 teaspoonful (scant); eggs, 3.

Proceed as above recipe.

Bran Pancakes.

(P. 8, F. 20, C. 2.)

1 egg beaten thoroughly; 3 tablespoonfuls of bran (washed); ½ teaspoonful of salt; ¼ teaspoonful of baking powder; 3 tablespoonfuls of cream.

Beat eggs thoroughly. Add salt, baking powder and cream. Wash bran thoroughly and add to other ingredients. Bake on griddle.

Thrice-cooked Vegetables.

Prepare and cut vegetables; then cover with cold water and bring to the boiling point; boil until tender. Drain off the water. Add more water and boil again for twenty minutes. Repeat this and salt the last time. Drain and serve with cream or butter, as desired. This method of preparation has been found very satisfactory for spinach, carrots, celery and beets, and often makes it possible for the person to use these vegetables in greater quantity than would otherwise be permissible. The vegetables listed retain their flavor and the spinach and carrots retain their color as well. They are supposed to have little or no food value.

Vegetable Soup for Nephritic Patients.[1]

(P. 14, F. 65, C. 96.)

Carrots, $\frac{1}{3}$ cup; turnips, $\frac{1}{3}$ cup; celery, $\frac{1}{2}$ cup; potato, $1\frac{1}{4}$ cups; onion, $\frac{1}{2}$ cup; water, 1 quart; butter, 5 tablespoonfuls; parsley, finely chopped, $\frac{1}{2}$ tablespoonful.

Wash, prepare and dice carrots, turnips, celery and potato. Cut onion in thin slices. Mix vegetables (except potatoes) and cook ten minutes in 4 tablespoonfuls of butter. Stir constantly. Add potatoes, cover and cook two minutes. Add water and boil until vegetables are soft. Add remaining butter and parsley.

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CHAPTER XXVI.

DIET FOR THE VARIOUS PERIODS OF LIFE.

The life of the individual may be divided into five periods: infancy, childhood, adolescence, maturity and old age. Each of these periods has its dietetic needs. The caloric need is relatively higher in infancy than at any other period, because it is the period of most rapid growth. The feeding is an important factor in infancy. The mother's milk is unquestionably the best food for the baby, and for a number of reasons:

1. The composition of human milk is perfectly balanced and cannot be perfectly imitated.

2. The curd of the human milk as it digests is softer and more flocculent than that of other milk.

3. Breast milk contains vitamins and other metabolic principles which are not found in substitutes.

4. It contains immune bodies which protect the baby, breast-fed babies having greater resistance and not being as susceptible to disease as those artificially fed.

The following procedures for infant- and child-feeding[1] are recommended:

PREPARATION OF INFANT FEEDINGS.

Before preparation of feedings:

1. Read the doctor's orders.

2. Scrub the hands well.

[1] The author is indebted to the Clinic in Pediatrics of the University Hospital for advice and assistance in formulating these procedures.

3. Wear a clean gown.

4. Wear mask over mouth and nose in case of upper respiratory infection.

5. Use clean towels.

Equipment for Preparation of Feedings.—Sterile towels; sterile forceps; sterile water; sterile cotton squares (4 inches square, to cover milk bottles); sterile absorbent cotton (2d grade—for plugs in nursing bottles); elastic bands; string tags to label bottles; sterile nursing bottles with racks; sterile milk bottles; scales and weights; paper napkins; medicine glass; aluminum saucepans; wooden stirring spoons; 1 knife; 1 fork; 1 teaspoon; 1 tablespoon; wire strainer; funnel; 2 graduates (1000 cc and 1500 cc); dairy thermometer; Dover egg-beater.

Materials for Food Preparation.—*Sugars.*—Cane sugar; lactose; dextri-maltose; karo syrup solution; wheat flour; barley water; whole milk.

All utensils used in the preparation of feedings should be separately stored and used for this purpose alone. Dish towels should be reserved for this purpose only, and these should be washed daily by the nurse who prepares the feedings.

The utensils used to make feedings are to be boiled ten minutes and placed on a sterile towel ready for use.

All milk, before and after its preparation, is to be kept on ice; bottles or any other containers of milk must not be left for any length of time uncovered.

After a formula is prepared the best method is to put the amount ordered for each feeding into a separate nursing bottle. That is, if the baby's order is for 120 cc at each of five feedings, put 120 cc of the prepared food in each of five nursing bottles. It is then ready for immediate use. Plug each bottle with cotton and keep it on ice.

If there are not enough nursing bottles available to do this, the entire quantity for feedings may be put into a quart milk bottle, which is to be covered and placed on ice. Then the desired amount for each feeding may be poured out into a sterile nursing bottle and heated for use. Never heat the whole quantity prepared in the quart bottle. Heat only the amount required for each feeding in the small nursing bottle.

A nipple should have three small holes, so that when the bottle is inverted the milk will just drip out slowly. A No. 10 sewing needle heated red-hot over a flame makes holes of the proper size for ordinary use. Stick the blunt end of the needle into a cork; it can then be heated and handled with ease.

Very thick milk mixtures, such as protein milk or lactic acid milk, require larger holes in the nipples. Occasionally a babe who nurses very slowly will also require a nipple with larger holes.

A child should spend at least ten minutes, and not over twenty minutes, in taking an ordinary milk preparation. He should lie on his side or may be held in the nurse's arms while feeding. The bottle must be tilted, so that the milk comes above the neck of the bottle or the babe will nurse in air. Never, under any conditions, prop the bottle and leave the babe alone with it.

It is well to stop the feeding two or three times and hold the babe upright, gently patting the back to help him regurgitate gas. This prevents vomiting.

After use, the bottle and nipple are to be washed in cold water; the nipple is then to be boiled for two minutes and placed in a jar of sterile boric acid solution or water, and is ready for use at the next feeding. The bottle is to be boiled and plugged with sterile cotton, ready for its succeeding use.

To heat milk to feed a babe, place the bottle containing the exact amount for one feeding in a pan of water at 105° F. for five minutes. Do not remove the cotton plug from the bottle or put the nipple on the bottle until it is ready for the baby's feeding.

The nurse who prepares feedings is responsible for the milk refrigerator. She must clean it well every day. Twice a week the ice and ice tray must be removed for more thorough scrubbing, and the drain must be flushed with sal soda.

As soon as the milk is delivered in the morning the bottles must be washed and put on ice until time to prepare feedings.

After the 2 P.M. feeding each day, if any prepared food remains unused it is to be thrown away and fresh preparations used for the 6 P.M. feeding.

Milk Mixtures in Common Use.—*Malt Soup.*—A. To a few tablespoons of milk add 5 level tablespoonfuls of wheat flour and rub to a thick paste. Make up to 11 ounces with whole milk by adding the milk slowly, stirring constantly, and putting the mixture through a strainer if there are any lumps in it.

B. Dissolve 4 tablespoonfuls of malt soup extract in 22 ounces of warm water.

C. Mix A and B and boil for three minutes, stirring constantly. Strain, bottle and keep on ice.

Five Per Cent Oatmeal Water.—Add 15 grams ($\frac{1}{2}$ ounce or 2 rounded tablespoonfuls) of dry uncooked oatmeal to 600 cc (20 ounces) of water. Add salt, 1 teaspoonful to the quart. Boil down to one-half the quantity. This takes from one and a quarter hours to one and a half hours. Strain, bottle and keep on ice.

Buttermilk Mixture.—To a few tablespoonfuls of buttermilk add 2 level tablespoonfuls of flour to make a thick paste; stir well to remove lumps. Make up to 1 quart with buttermilk.

A. Bring to the boiling point; remove from fire for five minutes.

B. Bring to the boiling point again; remove from fire for five minutes.

C. Add 4 level tablespoonfuls of cane sugar and bring to the boiling point the third time. (A, B and C, take about twenty minutes.)

Make up to 1 quart with water if any has boiled away. Bottle and keep on ice.

Milk Mixtures.—Modified Milk:

A. Sugar, kind and quantity ordered.

B. Sterile water or cereal water as ordered.

C. Milk in proportions ordered.

Mix A, B and C well, boil three minutes, stirring constantly; bottle and keep on ice.

Routine Nursery Formula Used to Complement Feeding of Newborn Babes.—$\frac{1}{3}$ cow's milk; $\frac{2}{3}$ lactose solution, 10 per cent.

Protein Milk, Albumin Milk, Eiweiss Milk, Casein Milk.—Heat 1000 cc of whole milk to 100° F. and add 8 cc essence of pepsin. Set it aside until it coagulates (about thirty minutes) and forms a firm curd. Cut in squares with a knife and let stand until the whey separates (about thirty minutes). Place a double thickness of gauze over a strainer, put the curd into it and let it drain for thirty minutes to one hour, or until the whey is all drained off. Usually 700 cc of the whey will be thus drained off. Do not stir the curd or squeeze it while it is draining, as this will toughen it.

Put the remaining curd in a fine wire sieve and mash it through with a wooden spoon. A pint of sterile water and a pint of buttermilk are to be added while it is being put through the sieve. Put the whole mixture through the sieve three times or until the curd is finely divided. Beat

for two minutes with a Dover egg-beater. The finished product should measure 1000 cc.

If dextri-maltose is ordered in protein milk, add the necessary amount to the sterile water and heat it until the sugar dissolves before adding it to the curd. Do not heat protein milk over 100° F., and do not try to boil it.

Lactic Acid Milk.—Symbols used in ordering lactic milk:

S. L. M. = skim lactic acid milk or buttermilk.
W. L. M. = whole lactic acid milk.
K. S. = karo syrup—50 per cent solution.

To prepare W. L. M.: Sterilize 900 cc of whole milk by boiling two minutes in a saucepan; place it in a sterile milk bottle, cover and let it stand until below 100° F. Then inoculate with Bulgarian bacilli, about 1 tablespoonful of culture to 1 quart of milk. Place bottle of milk in incubator, keeping at 100° F., for twelve hours, or until the milk coagulates. Remove and place it on ice until ready to prepare formula. S. L. M. is prepared in the same way when using skimmed milk in place of whole milk.

To prepare karo syrup, mix equal parts of "blue label karo syrup" (brown syrup) and water and bring the mixture to the boiling point in order to sterilize it; place in sterile bottle and keep it on ice.

To prepare lactic milk formula: Strain the lactic milk before using; mix with water and karo syrup solution in proportions ordered; bottle and keep it on ice. Do not boil lactic milk and do not heat over 100° F.

Keep an extra bottle of S. L. M. in the refrigerator to use as a culture. The culture should be renewed every two or three weeks.

Thick Cereal Mixture.—Use farina, Pillsbury's wheat cereal or cream of wheat.

To make 15 per cent of cereal mixture, add 150 grams of

cereal and 1 teaspoonful of salt to 1000 cc of water. Add 1 teaspoonful of salt. Have the water actively boiling in the inside container of the double boiler, placed directly over the flame; sift 150 cc of dry cereal into the water slowly, stirring constantly and boiling directly over the flame for two minutes. Then place the inside part of the double boiler in the outside kettle, containing water, and cook the mixture over a low flame for one hour, stirring frequently.

To Prepare Hoos' Albumin Milk.—Add 90 grams of Hoos' albumin milk powder to 1000 cc of warm sterile water. Measure the water, pour it into a pan and place the powder on the surface of the water; beat it with a Dover egg-beater until well mixed. Do not place the powder in the pan first and pour the water on it, as it will not mix properly. After mixing, pour the milk through a fine wire sieve or strainer, rubbing it through with a wooden spoon. Add dextri-maltose in percentage ordered; dissolve the latter in 30 cc of the original 1000 cc of warm water before adding it to the whole. Bottle the mixture and keep it on ice until needed for use.

DIETS FOR CHILDREN.

Ages at Six Weeks to Two Months.—Orange juice strained; begin by giving 1 teaspoonful, diluted with equal parts of water, once a day, increasing it to 1 tablespoonful twice a day.

At Three Months.—Cereal water added to feeding if babe is not breast-fed: Five per cent barley or oatmeal water.

At Six Months.—Cereal. Begin with 1 teaspoonful once a day, gradually increasing to 2 tablespoonfuls twice a day. Cream of wheat; farina; Pillsbury wheat cereal.

At Seven to Eight Months.—Add carrots or spinach to above; well cooked and strained. Begin with 1 teaspoonful

once a day, gradually increasing to 4 tablespoonfuls once a day.

Toast softened with water in which vegetables have been boiled. Add milk and vegetable soups.

At Nine Months.—Add baked apple; apple sauce.

At Ten to Twelve Months.—Whole milk can usually be given at this age. Diet should now consist of:

Toast softened with water in which vegetables have been boiled; apple sauce; baked apple; orange juice.

Cereals: Cream of wheat; farina; Pillsbury's wheat cereal.

Vegetables, strained: Carrots; spinach; string beans; peas; squash; creamed onions; cauliflower.

At Twelve to Eighteen Months.—Scraped meats (at eighteen months): beef; lamb; mutton; liver; sweetbreads; crisp bacon.

Vegetable soups.

Vegetables, strained: spinach; carrots; string beans; peas; asparagus; onions; Swiss chard; squash; cauliflower; celery; tomatoes.

Fruits: Apples; prunes; apricots; pears; plums; all the above to be stewed and strained. Baked apple; orange juice.

Cereals: Farina; cream of wheat; barley; Ralston's food; rice; oatmeal, strained.

Desserts without raisins: Junket; bread pudding; tapioca, plain; baked custard; cornstarch, plain.

Milk, 24 ounces in twenty-four hours.

Number of Feedings.—Give 5 feedings until after weaning, nine months to ten months; 4 feedings after ten months; 3 feedings after one year.

Eighteen Months to Two Years.—Give all foods mentioned above with the addition of the following: butter on bread; bread without toasting; any cereal may be given; it is no longer necessary to strain cereals; baked potatoes.

Desserts: Sugar cookies; prune whip; apple tapioca; sponge cake; plain cornstarch.

Two Years to Four Years.—Eggs; begin with a half egg once a week; gradually increase to a whole egg two or three times a week; all cooked fruits, none uncooked; all cereals unstrained; all vegetables above mentioned, including potatoes unstrained; minced and scraped meats above mentioned; cream soups.

Diet List for Children from Four Years to Ten Years.—Milk, 16 to 24 ounces in twenty-four hours; butter; egg once daily.

Meats: Chicken boiled, baked or broiled; lamb minced and roasted; beef minced, roasted; beefsteak broiled; mutton minced or roasted; bacon, crisp; sole, shad or trout, broiled or boiled; turkey minced, roasted. No fried or cold meats should be given.

Breads: Toast dry or milk-toast; stale bread; zwieback; plain crackers; whole wheat bread; plain Educator crackers.

Cereals: All cooked cereals; none uncooked.

Cream soups of any kind.

Vegetables: Fresh asparagus; string beans; peas; carrots; spinach; celery; Swiss chard; squash; lettuce; potatoes; lima beans; cauliflower; turnips; sweet potatoes; onions; tomatoes.

Fruits: Raw fruits; oranges, including pulp; apples; grapefruit; peaches. Berries or bananas should not be used uncooked. Fruits and very simple candies, such as sweet chocolate, should only be given after meals.

Desserts without raisins: Junket; plain rice pudding; plain cornstarch pudding; baked custard; prune whip; ice-cream, plain, once a week; plain cake; cookies, sugar; ginger-snaps; tapioca pudding; apple tapioca pudding; bread pudding; gelatin puddings.

Authorities to whom reference may be made for more

detailed directions regarding infant-feeding are Holt, Grule and Julius Hess.

The following table indicates the increase of weight during childhood:

Age.	Sex.	Weight in pounds.	Calories per kilo.	Weight in kilos.	Calories need.
Birth	Male	7.55	100	3.40	343
	Female	7.16	100	3.25	325
6 months	Male	16.00	85	7.27	617
	Female	15.50	85	7.04	598
12 "	Male	20.00	86	9.31	744
	Female	19.80	86	9.00	720
18 "	Male	22.80	75	10.36	777
	Female	22.00	75	10.00	750
2 years	Male	26.50	70	12.04	842
	Female	25.50	70	11.59	811
3 "	Male	31.20	65	14.18	921
	Female	30.00	65	13.63	885
4 "	Male	35.00	65	15.90	1033
	Female	34.00	65	15.45	1004
5 "	Male	41.20	65	18.72	1216
	Female	39.80	65	18.09	1175
6 "	Male	45.10	65	20.50	1332
	Female	43.80	65	19.90	1293
7 "	Male	49.50	65	22.50	1462
	Female	48.00	65	21.81	1417
8 "	Male	54.50	60	24.77	1486
	Female	52.90	60	24.04	1442
9 "	Male	60.00	60	27.27	1636
	Female	57.50	60	26.13	1567
10 "	Male	66.60	60	30.27	1816
	Female	64.60	60	29.13	1747
11 "	Male	72.40	60	32.90	1974
	Female	70.30	60	31.95	1917

12 years to maturity

A. Period of structural activity . . 50

B. Period of functional activity:

Female 55

Male 60

Period of maturity 37–55

Period of decline or old age . . . 34–40

The characteristic feature of childhood is the gradual decline in the rate of growth. Meals in childhood should be regularly served, and should be simple in character. The child should be required to form good eating habits. Meals should not be eaten in haste or carried from the table. No

dislikes of certain foods should be encouraged. No lunching should be allowed between meals. Simple sweets should be served at the table to satisfy the craving for such foods. This can be achieved with simple desserts and fruits, either dried or cooked; sponge cake, cookies or sweet chocolates given at the end of the meal.

ADOLESCENCE.

Adolescence marks the close of childhood. The demand for food is active as adolescence covers a period of both functional and structural activity. There is a tendency toward food idiosyncrasies and an abnormal appetite for sweets and protein foods, with little inclination toward fats.

During this period the appetite is not always a safe guide and the meals should be carefully planned and nicely served. If the meals are regular and substantial, yet attractive, they may modify the excessive craving for sugars. It is well to provide a liberal, well-balanced diet, not neglecting the green vegetables, fresh root vegetables and fresh fruits. The amount of food required is an individual problem, depending upon the degree of functional activity. Tea and coffee should be restricted. Adolescence continues up to a variable age, between twenty to twenty-four years for the female and twenty-four to twenty-seven years for the male.

MATURITY.

The adult has a more rapid digestive rate and digestive power is greater than at other periods of life. The amount of food necessary to maintain nutrition is influenced by age, sex, extent of body surface, weight, occupation and climate. Digestion is more robust in the cold days of fall and to the end of winter, while a decline in digestive power occurs in

the spring. This calls for seasonable variations in the diet, making it easier of digestion during the hot weather. More substantial foods and those of higher energy production are required during the winter.

A general rule to follow in planning the dietary of the normal adult is to allow 10 per cent of the total calories in protein, 30 per cent in fats and 60 per cent in carbohydrates. Six to 8 pints of water a day should be taken, half of which may be counted upon as contained in the foodstuffs.

OLD AGE.

Old age decline begins at an age varying between sixty and seventy years. Structural changes occur in the body and functional activity should be less strenuous. The muscles lose tone and mass. The organs of digestion are apt to share in this degeneration, making it necessary to decrease the demands upon the digestive tract. The teeth may be lost and mastication therefore becomes difficult. Foods that are mechanically easy should be served.

The diet should depend largely upon the activity and digestive ability of the individual. In most cases it should consist of simple, easily digested food containing a relatively small amount of protein. If there is difficulty in mastication the food may be minced or ground. Protein may be supplied in the form of milk, eggs, chicken, fish, roast or scraped beef. An abundance of water should be taken. The meals should be light but may be frequent, nourishment being given between meals and before retiring.

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CHAPTER XXVII.

DIETARY CONDITIONS OF THE SICK.

There are certain general conditions which govern the dietetic treatment of the sick.

1. The patient's nutritive condition prior to the attack with particular reference to weight. Weight is an index to the nutrition of the individual. In determining caloric need, the normal weight is used.

2. The nature of the attack, whether it is a chronic, continuing or an acute and self-limited disorder.

3. The intensity or virulence of the attack, the index to which is commonly the temperature chart. It is held that internal chemical changes are accelerated three times over with every 10° increase of temperature.

4. The localization of the disturbance is a dietary consideration.

5. The condition of the digestive tract is to be studied with reference to the patient's digestive power.

6. Conditions of elimination must be taken into account.

The Tray.—In planning food for the sick, economy, excepting among the very poor, should not be a prime consideration. Whatever will hasten recovery should be given, provided it complies with the doctor's orders. The nurse has a better opportunity than the doctor to study the likes and dislikes of the patient. If the diet the doctor orders does not agree with or is disliked by the patient, the fact should be reported to the doctor for his direction of a change. While a knowledge of dietetics is necessary to enable one to substitute one food for another, in serious cases this knowledge should be directed by the physician's instructions.

Hospital diets may be classified as follows:

Liquid diet.	Semisolid diet.	Light diet.	General diet.	Special diet.
Milk	Milk toast	All items included under semisolid diet plus:	Regular diet, excluding:	Diabetic, cardiac, salt-free, etc.
Buttermilk	Cream toast	Fruit (cooked)	Pork	
Eggnog	Cereals (well-cooked)	Fruit (raw except bananas)	Corned beef	
Albumins	Eggs (creamed or poached)	Bread or toast	Veal	
Orangeade	Soups (strain out all coarse vegetables)	Bacon	Cabbage	
Lemonade	Custards	Green vegetables (excepting cauliflower, radishes, cabbage)	Cake (excepting sponge cake)	
Broths	Cornstarch pudding	Baked potato	Pastry	
Cocoa	Rice	Vegetable salads	Hot breads	
Sherbet	Tapioca	White fish	Fried foods	
Tea		Baked or broiled halibut		
Coffee		Small amount of white meat of chicken		
Fruit gelatin		Scraped beef		
Fuit juices		Creamed sweetbreads		
Ice-cream				
Junket				
Thin gruels				

Precautions.—The following details should be noted in serving food to the convalescent:

1. Punctuality of meal service. Most people develop an unconscious habit in the matter of meals, and if they are delayed the appetite in the convalescent may be gone.

2. Noise and odor in the preparation of food are to be avoided.

3. Food selection is not to be discussed with the patient. If possible each tray should be a surprise, governed by a familiarity with the likes and dislikes of the patient.

4. The patient's interest in meals is usually exaggerated. The diversions of the sick-room are limited and the patient

is much affected by his immediate surroundings. For this reason the tray and its appearance are very important details. A carelessly prepared, unattractive tray may completely destroy the appetite of a refined or fastidious patient.

5. If the patient can sit up for only a few hours, utilize this time for the serving of meals.

6. If the diet is limited the patient will enjoy the service of meals in courses instead of the appearance of a full tray.

7. Serve only small quantities of each kind of food. A second serving may be brought if desired and the danger of a loss of appetite will be avoided.

8. Foods to be served hot must be hot, not lukewarm; foods to be served cold must be cold, but not iced.

9. Do not fill glasses over two-thirds full.

10. Serve the food in a form easy for the patient to handle and choose foods whose nutritive values are high in proportion to their bulk.

11. If beverages are to be served alone, use a small tray or plate covered with a doily or small napkin.

12. Do not allow food or dishes to stand for any length of time in the sick-room; remove them as soon as possible after the meal. If anything must remain for a short time it should be covered.

To Prepare the Tray.—1. Cover the tray with a clean tray cloth. The cloth should be immaculate and free from creases or wrinkles.

2. Use the most attractive silver and daintiest china and glass available.

3. Use some simple decoration, as a single flower in a small vase. Even a bit of green is better than no decoration.

4. The tray should not have a crowded appearance, but should include everything needed for the meal.

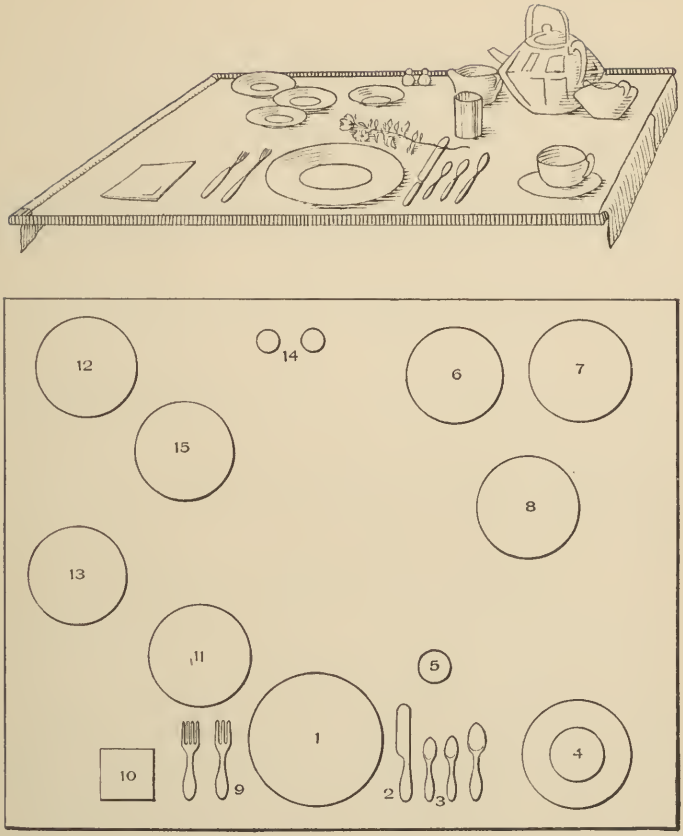

FIG. 6.—Arrangement of tray: 1, plate; 2, knife (sharp edge toward plate); 3, spoons; 4, cup and saucer; 5, glass; 6, creamer; 7, sugar bowl; 8, teapot; 9, forks (tines up); 10, napkin (closed edge toward fork); 11, bread and butter plate; 12, dessert dish; 13, vegetable dish; 14, salt and pepper; 15, salad plate.

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CHAPTER XXVIII.

DIET IN DISEASE.

Fever.—Acute and continued.

Disorders of Metabolism: Diabetes; diseases of the liver; obesity; goiter; purin-free feeding.

Gastro-intestinal Disorders: Gastritis; gastric ulcer; gastric atony; gastro-enteritis; mucous colitis; dysentery; constipation.

Renal Disturbances: Acute nephritis; chronic nephritis.

Cardiac Conditions: Decompensated heart; decompensated heart with edema.

Miscellaneous Disorders: Anemia; hypertension; skin diseases.

DIETETIC TREATMENT OF FEVERS.

In self-limited, acute fevers of short duration, as in measles, mumps and scarlet fever, the diet is not important. A light diet may be used. Fluids should be forced.

In fevers of long duration, as in typhoid, typhus and bronchopneumonia, the diet is an important factor. Nutrition must be maintained and easily digested foods must be chosen. A very high calorie diet may be used and inroads upon the body tissues prevented if the food is carefully selected and prepared.

In typhoid the intestinal mucosa is damaged and coarse or unstrained food which may further break it down must be avoided. Liquid diet and soaked or strained foods are used until the temperature has remained normal for two days, and then unsoaked crackers and toast may be added. At the end of a week of normal temperature the more

delicate meats are permitted, after which a gradual return to a general diet is desirable.

Dietary of Typhoid Fever.—Until the temperature has been normal for two days, give the following diet, allowing at least 3000 calories daily, in 6 feedings, at the following hours: 8 A.M., 10 A.M., 12 M., 2 P.M., 5 P.M., 8 P.M. Force the use of fluids.

Lemon juice
Orange juice
Grape juice
Grapefruit juice
Pineapple juice
Orange ice
Lemon ice
Grape ice
Grapefruit ice
Pineapple ice
Apple sauce with whipped cream
Oatmeal gruel with cream and butter
Chocolate blanc mange
Lactose fudge ($\frac{1}{2}$ ounce daily)
Soaked toast
Soaked crackers
Hominy gruel
Rice gruel
Blanc mange
Milk and cream
Fruit albumin
Junket
Soft-boiled eggs, cooked in shell
Poached eggs
Milk toast
Cream toast
Eggnog
Buttermilk
Cream of tomato soup
Cream of asparagus soup
Cream of celery soup
Cream of potato soup
Boiled custard
Baked custard
Caramel custard
Floating island
Ice-cream
Chocolate ice-cream
Hot chocolate
Cocoa
Prune whip
Apricot whip
Gelatin with whipped cream
Parfait
Malted milk
Egg chocolate malted milk
Milk shake
Chocolate milk shake
Bavarian creams

When the temperature has remained normal for two days, add the following: mashed potatoes; rice; cream of wheat; buttered toast; dry crackers; tapioca.

When the temperature has been normal one week, add the following: scraped beef; creamed sweetbreads; bacon; minced chicken; flaked fresh fish.

SPECIMEN TYPHOID DIETS.

1500 *Calories.*

8 A.M.—Farina gruel: Milk, ½ cup; cream, ⅛ cup; farina, ⅜ cup; salt.
10 A.M.—Milk, ½ cup.
Cream, ⅛ cup.
12 M. —Farina gruel: Milk, ½ cup; cream, ⅛ cup; farina, ⅜ cup; salt.
2 P.M.—Milk, ½ cup.
Cream, ⅛ cup.
4 P.M.—Custard, ½ cup.
6 P.M.—Eggnog: Egg, 1; milk, ½ cup; lactose, 1 teaspoonful; speck of salt.
8 P.M.—Milk, ½ cup.
Cream, ⅛ cup.

2000 *Calories.*

8 A.M.—Farina gruel: Farina, ⅜ cup; milk, ½ cup; cream, ¼ cup; salt.
10 A.M.—Milk, ½ cup.
Cream, ⅛ cup.
12 M. —Farina gruel: Farina, ⅜ cup; milk, ½ cup; cream, ⅛ cup; salt.
Custard, ⅓ cup.
2 P.M.—Orange juice, ½ cup.
Water, ½ cup.
4 P.M.—Custard, ⅓ cup.
6 P.M.—Eggnog: Egg, 1; milk, ½ cup; cream, ⅛ cup; lactose, 1 teaspoonful; speck of salt.
Blanc mange, ½ cup.
8 P.M.—Malted milk, 1 cup.

2400 *Calories.*

8 A.M.—Farina gruel: Milk, ½ cup; cream, ⅛ cup; farina, ⅜ cup; salt.
Toast, ½ slice.
10 A.M.—Cocoa, ½ cup.
12 M. —Eggnog: Milk, ½ cup; cream, ⅛ cup; egg, 1; lactose, 1 teaspoonful.
Cream of pea soup, ⅔ cup.
Toast, ½ slice.
Tapioca cream, ⅗ cup.
2 P.M.—Malted milk, 1 cup.
4 P.M.—Custard, ⅓ cup.
6 P.M.—Farina gruel: Farina, ¾ cup; milk, ½ cup; cream, ⅛ cup; salt.
Toast, ½ slice.
Custard, ⅛ cup.
8 P.M.—Milk, ½ cup.
Cream, ⅛ cup.

2700 *Calories.*

8 A.M.—Farina gruel: Milk, ½ cup; cream, ¼ cup; farina, ¾ cup; salt.
Toast, 1 slice.
10 A.M.—Cocoa, 1 cup.
12 M. —Cream of tomato soup, ⅔ cup.
Egg, 1.
Toast, 1 slice.
Butter, 1 tablespoonful.
Ice-cream, ¾ cup.
2 P.M.—Malted milk, 1 cup.
4 P.M.—Buttermilk, 1 glass.
6 P.M.—Farina gruel: Farina, ¾ cup; milk, ½ cup; cream, ⅛ cup; salt.
Milk, ½ cup.
Toast, 1 slice.
Butter, 1 tablespoonful.
Lemon gelatin, ¾ cup.
Whipped cream, 2 tablespoonfuls.
8 P.M.—Milk, ½ cup.
Cream, ⅛ cup.
Lactose, 15 gm.

3000 *Calories.*

8 A.M.—Farina gruel: Farina, ¾ cup; milk, ½ cup; cream, ¼ cup; salt.
Toast, 1 slice.
Butter, 1 tablespoonful.
10 A.M.—Cocoa, 1 cup.
12 M. —Milk toast: Milk, ½ cup; cream, ⅛ cup; toast, 1 slice.
Cream of tomato soup, ⅔ cup.
Egg, 1.
Ice-cream, ¾ cup.
Butter, 1 tablespoonful.
2 P.M.—Malted milk, 1 cup.
4 P.M.—Orange albumin.
6 P.M.—Farina gruel: Farina, ¾ cup; milk, ½ cup; cream, ¼ cup; salt.
Toast, 1 slice.
Butter, 1 tablespoonful.
Caramel cornstarch pudding, ½ cup.
8 P.M.—Chocolate eggnog, 1 glass.

3500 *Calories.*

8 A.M.—Farina gruel: Farina, ¾ cup; milk, ½ cup; cream, ¼ cup; salt.
Toast, 1 slice.
Butter, 1 tablespoonful.
10 A.M.—Cocoa, 1 cup.
12 M. —Milk toast: Milk, ½ cup; cream, ¼ cup; toast, 1 slice.
Cream of pea soup, ⅔ cup.
Egg, 1.
Chocolate blanc mange, ¾ cup.
Butter, 2 tablespoonfuls.
2 P.M.—Malted milk, 1 cup.
4 P.M.—Orangeade, 1 cup.
6 P.M.—Farina gruel: Farina, ¾ cup; milk, ½ cup; cream, ¼ cup; salt.
Milk, ½ cup.
Toast, 1 slice.
Butter, 1¼ tablespoonfuls.
Egg, 1.
Cup custard, ½ cup.
8 P.M.—Chocolate eggnog, 1 glass.

4000 *Calories.*

8 A.M.—Farina gruel: Farina, ¾ cup; milk, ½ cup; cream, ¼ cup; salt.
Toast, 1 slice.
Butter, 2 tablespoonfuls.
10 A.M.—Cocoa, 1 cup.
12 M. —Milk toast: Milk, ½ cup; cream, ¼ cup; toast, 1 slice.
Cream of pea soup, ⅔ cup.
Egg, 1.
Ice-cream, ¾ cup.
Butter, 2 tablespoonfuls.
2 P.M.—Malted milk, 1 cup.
4 P.M.—Orangeade, 1 cup.
6 P.M.—Farina gruel: Farina, ¾ cup; milk, ½ cup; cream, ¼ cup; salt.
Toast, 1 slice.
Butter, 2 tablespoonfuls.
Egg, 1.
Cornstarch pudding, ¾ cup.
8 P.M.—Chocolate eggnog, 1 glass.
Malted milk, 1 glass.

DISORDERS OF METABOLISM.

Diabetes. — Diabetes is characterized by a diminished ability to utilize the carbohydrate foods and the consequent appearance of sugar in the urine. The diabetic has a definite limit of tolerance for carbohydrates, and beyond this limit the sugars are excreted. It is impossible to completely cut off the carbohydrate supply, as this causes the formation of

dangerous products, acetone bodies, which arise in the course of the metabolism of the fatty acids and give rise to a form of intoxication known as acidosis.

It is also possible that the diabetic may convert protein into sugar. In this event the question of diet is further complicated, since all food groups must be considered. Several methods are used in the treatment of diabetes, the fundamental principles of which are essentially the same.

The chief aim is to reduce the diet until the patient is both sugar- and acetone-free. He should remain in hospital until this is accomplished and the carbohydrate limit has been established. "The Joslin treatment" is recommended.

The Joslin treatment for mild and moderately mild diabetes (cases not hospitalized) consists in a gradual reduction of the amount of carbohydrates; omitting, first, sugar, as such, and then further gradually reducing the carbohydrate intake until the patient is sugar-free.

The Joslin treatment for more severe cases (hospitalized patients) is (1) to omit fats; (2) omit proteins; (3) lessen the carbohydrates until the patient is getting less than 10 grams; and then starve.

During starvation force the fluids, giving broth, tea and coffee and thrice-cooked vegetables at meal times.

Starvation is continued for four days or until the urine is sugar-free. If not sugar-free at end of four days, give $\frac{1}{2}$ gram protein or 1 gram carbohydrate per kilo for two days, and then starve for three days; then give the same amount of carbohydrate and protein again for four days and fast one day.

When sugar-free, add 5 to 10 grams of carbohydrates daily until sugar appears in the urine; then fast until sugar-free; then reduce the carbohydrates to $\frac{2}{3}$ of this tolerance and add 15 to 20 grams of protein daily until 1 to $1\frac{1}{2}$ grams per

kilos are given; then add fats until caloric requirement is reached.

First day:	Carbohydrate	150 grams
	Protein	75 grams
	Fat	0 grams
Second day:	Carbohydrate	150 grams
	Protein	35 grams
	Fat	0 grams
Third day:	Carbohydrate	75 grams
	Protein	0 grams
	Fat	0 grams
Fourth day:	Carbohydrate	38 grams
	Protein	0 grams
	Fat	0 grams
Fifth day:	Carbohydrate	19 grams
	Protein	0 grams
	Fat	0 grams
Sixth day:	Carbohydrate	9 grams
	Protein	0 grams
	Fat	0 grams
Seventh day:	Starvation	

The Allen treatment differs from the above in that fasting is begun at once and continued until the patient is sugar-free. After the patient is sugar-free the diet is similar to the above, excepting that alcohol is included in the diet.

Starvation.—As a control, one day of starvation in each week is suggested. It is advisable in selecting the foods to use those of low carbohydrate content. Diabetics will show sugar on a diet which contains the 20 per cent carbohydrate containing vegetables, while they will continue to use the same number of grams of carbohydrates in those vegetables and fruits which contain 10 per cent or less, and will remain sugar-free.

TYPICAL DIABETIC DIET.

Tolerance: Protein, 70; fat, 160; carbohydrate, 100

	Weight, gms.	Approximate measure.	Protein, gms.	Fat, gms.	Carbohydrate, gms.
Breakfast, 8 A.M.:					
Grapefruit	300	½ large	2.37	0.60	30.27
Omelet:					
Egg	50	1 average	6.70	6.00	
Butter	10	1 tb., scant	0.10	8.50	
Cream	20	1 tablespoonful	0.74	5.14	0.71
Agar bran cakes	..	1	1.48	1.16	
Butter	10	1 tb., scant	1.00	8.50	
Cream	20	1 tb., scant	0.74	5.14	0.71
Coffee	..	1 small pot			
10 A.M.:					
Orangeade	220	1 glass	1.29	0.23	18.60
Agar bran cakes	..	1	1.48	1.16	
Butter	5	½ tb., scant	0.05	4.25	
Dinner, 12 M.:					
Broth	..	1 bowl			
Chicken	100	1 slice	19.3	16.3	
Cauliflower	120	2 tb., heaping	1.08	0.12	0.48
Hollandaise sauce	20	1 tablespoonful	0.92	8.68	0.16
Agar bran cakes	..	1	1.48	1.16	
Butter	10	1 tb., scant	0.10	8.50	
Junket (milk)	110	1 serving	3.63	4.40	5.50
Cream	20	1 tablespoonful	0.74	5.14	0.71
Coffee	..	1 small pot			
2 P.M.:					
Buttermilk	218	1 glass	6.54	1.09	10.46
Agar bran cakes	..	1	1.48	1.16	
Butter	5	½ tb., scant	0.05	4.25	
Supper, 6 P.M.:					
Cold chicken	75	1 small slice	14.46	12.21	
Carrots	100	3 tb., heaping	0.53	0.17	9.30
Cream	40	2 tablespoonfuls	1.48	10.28	1.42
Tomato salad:					
Tomatoes	100	½ medium	1.20	0.20	4.00
Lettuce	10	2 small leaves	0.12	0.03	0.29
Mayonnaise	21	1 tablespoonful	0.26	19.92	0.05
Agar bran cakes	..	1	1.48	1.16	
Butter	10	1 tb., scant	0.10	8.50	
Cream	20	1 tablespoonful	0.74	5.14	0.71
Tea	..	1 small pot			
Orange agar jelly (1 orange)	220	1 serving	1.29	0.23	18.60
8 P.M.:					
Broth	..	1 bowl			
Agar bran cakes	..	1	1.48	1.16	
Butter	10	1 tb., scant	0.10	8.50	

The University of Minnesota

UNIVERSITY HOSPITAL

SPECIAL DIET CHART

Patient .....

Physician ..... Diet Nurse .....

Diagnosis .....

Date.

Amt. Sent.	Amt. Consumed.	Water.	Protein.	Fat.	C. H. O.	Calories.	Food Material
							Apples
							Asparagus
							Bacon
							Beets
							Bread
							Butter
							Carrots
							Cereal
							Cabbage
							Celery
							Chops
							Cream
							Cheese
							Cauliflower
							Egg White
							Egg Yolk
							Fish
							Flour
							Ham
							Lettuce
							Milk, Whole
							Milk, Skim
							Mushrooms
							Orange
							Olive Oil
							Onion
							Peas
							Potato
							Steak
							Sugar
							Total Chloride
							Totals

Diseases of the Liver.—When the liver is incapacitated there is a lessening in the output of bile. As the bile is needed for the emulsification and absorption of fat, this type of food must be restricted in the dietary under these circumstances. Another function of the liver is the conversion of the blood-sugar into glycogen and its storage, as a glycogen-forming power may be impaired, so that in this event the carbohydrate foods should also be restricted.

In an acute catarrh of the bile ducts the patient is subjected to a period of dietetic rest and the digestive tract is cleaned out. Following this a light diet is indicated, eliminating fats and sugars.

Typical Fat-free Diet.

Breakfast: Fresh or cooked fruit; shredded wheat; skimmed milk; dry toast; egg; coffee.

Dinner: Broiled or boiled fish (halibut); lean meat or fowl; baked potato; spinach with lemon juice; green peas; bread; tea with skim milk; cornstarch blanc mange.

Supper: Tomato broth with rice or crackers; broiled sweetbreads; cottage-cheese salad; toast or bread; baked apple; coffee with skimmed milk.

Obesity.—This condition is usually the result of the excessive use of carbohydrate and fat food, with a lack of exercise. A quantity of food which may be safely consumed by one individual will prove excessive in another, the difference depending upon the digestive and metabolic power, the degree of functional and especially of muscular activity and the eliminative efficiency.

Diet for the Obese.

Breakfast: Cup of black coffee with skimmed milk, without cream or sugar; raw fruit (orange, apple, pear, grapefruit); eggs (1 creamed or 2 boiled or poached); toast (1 or 2 small slices, 10 to 20 grams, usually without butter, or a bran muffin).

9.30. Coffee, one cup; bouillon (250 cc); skimmed milk, butter-milk or fruit.

Luncheon: Clear soup (120 cc); moderately lean meat or fish (100 grams) or eggs; two kinds of fresh vegetables (50 to 100 grams each), as spinach, lettuce, onions, lentils, beets, carrots, cabbage, cauliflower, string beans, celery or squash; bran muffin, one; tea, one cup.

Dinner: Moderately lean meat or fish (100 to 150 grams); two varieties of green vegetables (50 to 100 grams each); salad, fruit or vegetables, with small quantity of French dressing; raw, unsweetened cooked fruit (orange, grapefruit, apple, pear or grapes); coffee, one cup.

Above menu given according to caloric maximum and minimum values as follows:

	Protein.	Fat.	CHO.	Calories.
Minimum	60	50	70	1000
Maximum	100	70	165	1738

Foods allowed: All lean meats excepting pork, bacon, goose, sausage, fish.

Fish (excepting shad, fresh salmon, sardines, mackerel, blue fish and all fried fish).

Thin soups in moderation.

Eggs in any form except scrambled, fried or omeleted.

Fruits: All fresh varieties (excepting bananas); berries (without cream or sugar) cooked with saccharin.

Vegetables: String beans, water-cress, lettuce, radishes, cucumbers, asparagus, green peas, Brussels sprouts, cabbage, cauliflower, onions, celery, tomatoes, spinach, squash, beets, turnips, carrots, parsnips.

Miscellaneous items: Tea, coffee, skimmed milk, ginger ale; desserts made of gelatin or Irish moss with but little sugar; use saccharin if possible; bran biscuits.

Goiter.—Goiter is very common around the Great Lakes and in regions far from the sea, such as the mountains of Scotland and Switzerland. It is due to a lack of iodin in the soil, which results in a lack of iodin in the diet of those living in these localities. Adding suitable amounts of sodium iodide to the diet will correct this deficiency and provide a means of preventing goiters.

Kellogg states that "The diet should be made antitoxic, including liberal quantities of greens, and particularly the following foods, which analysis has shown to contain iodin in appreciable quantities; turnips, melons, lettuce, beets, tomatoes, French beans, green peas, radishes, carrots, parsley and potato. Observations of Chalmers Watson suggest the special value of oatmeal in the feeding of persons suffering from simple goiter."

The Purin-free Diet.—Uric acid is supposed to be derived from the nucleoproteins. The purins may come from the breaking down of nuclear material in the food or in the body tissues themselves. In gout, uric acid is deposited in the joints, and these cases are placed on a purin-free diet. Tea, coffee and cocoa are forbidden.

Purin-free Diet.

Breakfast: Grapefruit; cream of wheat; milk; cream; eggs; butter; bread; sugar; cereal coffee.

Dinner: Cream of corn soup; mashed potatoes; bread; milk; baked apple with whipped cream; sugar.

Supper: Creamed rice with cheese; scrambled egg; toast; butter; milk; pear sauce; cereal coffee; cream; sugar.

PURIN CONTENT OF FOODS (RECKONED AS URIC ACID)[1] ACCORDING TO SCHMID AND BESSAU, WALKER HALL AND HESSE.

100 gms. contain	Uric acid, gms.	100 gms. contain	Uric acid, gms.
Beef	0.111–0.189	Salmon	0.072–0.201
Mutton	0.078–0.191	Carp	0.162
Pork	0.123–0.185	Herring	0.207
Veal	0.114–0.189	Sardines in oil	0.354
Ham (raw)	0.072–0.139	Anchovy	0.465
Tongue (calf)	0.165	Oysters	0.087–0.217
Brain (pig)	0.084–0.233	Lobsters	0.066
Liver (beef)	0.279–0.372	Caviar	0.110
Kidney	0.240–0.320	Cauliflower	0.024
Thymus (calf)	0.990–1.308	Spinach	0.072
Chicken	0.087–0.186	Celery	0.015
Pigeon	0.174–0.154	Asparagus	0.024–0.057
Goose	0.099	String beans	0.006
Venison	0.117–0.182	Potatoes	0.006
Bouillon	0.045–0.151	Mushrooms	0.015–0.019
Meat extract	2.000–3.000	Peas	0.054–0.079
Trout	0.213	Lentils	0.075–0.162
Shellfish	0.117	Beans	0.051–0.098
Cod	0.067–0.131	Oatmeal	0.064

The following foods contain no purins:

Bread	Beets
Cereals	Onions
Fruits	Port
Eggs	Sherry
Milk	Bordeaux.
Cheese	

PURIN CONTENT OF BEVERAGES ACCORDING TO WALKER HALL AND LABBE.

100 gms. contain.	Chiefly methylpurins. Uric acid, gms.
Coffee (roasted)	1.24
Tea	1.35–3.58
Chocolate	1.43
Cocoa	1.30
Beer	0.016

[1] Forchheimer: Therapeusis of Internal Diseases (courtesy of D. Appleton & Co.).

GASTRO-INTESTINAL DISORDERS.

Gastritis.—The first step is complete starvation until the vomiting ceases, which may be a matter of twelve to forty-eight hours. The first foods given may be koumyss, buttermilk, peptonized milk, orange albumin and ginger ale. The amount of the feeding should be very small at first; only a spoonful every half-hour, gradually increasing the amount and lengthening the interval between feedings. When the acute stage is past, add strained gruels made of cereals and diluted with milk. If these are tolerated, gradually increase the diet, giving semisolid foods at first and slowly reaching a general but simple diet. All coarse, highly-seasoned food must be avoided for an indefinite time.

Chronic Gastritis.—A gastric test meal is necessary before planning a diet for this condition. The disease may be complicated by gastric atony, hyperacidity or hypoacidity. The diet should follow that of acute gastritis—bland, easily digested foods being indicated. If hyperacidity is present avoid acid foods, coarse foods, spiced foods and alcohol. Both very hot and cold foods are to be denied. If accompanied by hypoacidity, restrict the use of meats; avoid soups; take water in small quantities, but otherwise follow the diet for hyperacidity.

Seven-hour Motor Meal.

Object: To give a balanced meal to test the normality of gastric digestion the following will serve: steak; mashed potatoes; tomatoes; bread and butter; tea and cream; prune whip; one-half cup of raisins.

Any well-balanced meal, with the addition of the raisins, may be used in place of this menu.

The meal is usually given at 1 A.M. and removed by gastric expression at 8 A.M.

Gastric Atony.—The muscles of the stomach are in a state of rest when in tonic contraction. The stomach relaxes to receive food. When these muscles lose tone and consequently the stomach fails of tonic contraction it fails to rest. Avoid water with meals, as this causes relaxation, but give hot water one hour before the meal. This acts as a stimulus, dilates the bloodvessels and improves the motor power. Fruit juices may be given between the meals to encourage secretion of the gastric juice. The diet consists of fruit juices, cooked fruit, toast, eggs, rice, vegetable purees, cooked celery, spinach, asparagus, cauliflower, scraped beef or mutton, chopped fish, liver or bacon and baked potatoes.

Gastro-enteritis.—The diet should be of bland foods, easily digested and leaving little residue to stimulate the muscular contraction of the walls of the intestines. Starvation is indicated for a variable period, probably twenty-four to forty-eight hours. Give no ice water during this time, but water with the chill off may be used. Begin feeding with clear broth, cereal gruels and dry toast, gradually adding lean fish, chicken, eggs, rice, macaroni, finely divided cereals, a little sugar, farinaceous desserts, gelatin, toast, cream, boiled milk.

Avoid fats, coarse vegetables, raw milk, fruit, condiments, pastry, cakes, sugar and all rich or highly flavored meats.

Mucous Colitis.—As these cases progress and pass from one stage into another the diet should be altered in character. While there is inflammation in the bowel the food must be of the non-residue type. Cold fluids are restricted and the most easily digested carbohydrates are selected: arrowroot,

sago, tapioca, cornstarch, rice, spaghetti and macaroni are prepared with boiled milk as gruels. Sugar may be used and also beef broth. This diet may be used from one week to four weeks, depending upon the condition of the patient.

When the second stage is reached, strained, cooked fruits and vegetable purees and toast are added.

The third stage calls for a different type of diet, due to the tendency to constipation. Fats in quantity are added, with cream, butter and Mayonnaise. Use coarse salad vegetables, bran bread, raw and cooked fruits, agar jelly and prunes cooked in senna. Senna prunes may be given in large dishes at first, 6 prunes and 6 teaspoonfuls of juice for breakfast and supper, gradually cutting quantity down.

Gastric Ulcer.—In this condition the patient is confined at first to the exclusive use of milk given every hour. The object is to keep the ulcer bathed in milk so that the gastric juices do not attack it. The Sippy diet is recommended for these cases.

Sippy Diet.

The patient remains in bed for three or four weeks; unless some serious complication sets in, some or all of his regular work may be done at the end of four or five weeks. A wide variety of soft and palatable foods may be given. The following plan of diet has been found to be most adaptable:

Two or 3 ounces of a mixture of equal parts of milk and cream are given every hour from 7 A.M. until 9 P.M. When the gastric contents show an alkaline reaction for three days, soft eggs and well-cooked cereals are added, until at the end of ten days the patient is receiving approximately the following nourishment: 3 ounces of milk or cream every hour from 7 A.M. to 9 P.M. In addition 3 soft eggs, 1 at a time, and 9 ounces of cereal, which is measured after it has been pre-

pared. Cream soups of various kinds, vegetable purees and other soft foods may be substituted now and then as desired.

The total bulk at one feeding, while food is taken every hour, should not exceed 8 ounces. Many of the feedings will not equal that quantity. The patient should be weighed, and, if desired, a sufficient quantity of food may be given to cause a gain of 2 or 3 pounds each week. A large variety of soft and palatable foods may be used, such as jellies, custards, creams, etc. The basis of the diet, however, should be milk, cream, cereals and vegetable purees. Meat is not given during the active period of observation, since it interferes with the tests for occult blood in the stools and aspirated stomach contents. The acidity is more easily controlled by feeding every hour and giving the alkalies midway between feedings. The milk and cream take care of three-fourths of the acid of the stomach and the alkali the other one-fourth.

Ten grains each of heavy calcium magnesia and sodium bicarbonate, alternating with a powder containing 10 grains of bismuth subcarbonate and 20 to 30 grains of sodium bicarbonate, may be given midway between feedings. If the patient has suffered from stagnation of food, larger quantities of alkalines are required. The patient is kept on a modified diet for one year. Five meals of easily digestible food are advised and no meat is allowed.

Acute Dysentery.—Starvation for twenty-four hours or more to quiet the peristalsis is followed by liquid protein diet, albumen water, whey and broth. Later koumyss and gruels are given followed by scraped beef, toast, rice, macaroni and soft-cooked eggs.

Chronic Dysentery.—A more generous diet must be given here to prevent loss of weight. Easily digested foods which leave no residue to excite peristalsis, yet are sufficiently nutritive to maintain nutrition, are used. The diet given in diarrhea may be used.

Constipation.—A generous use of coarse foods such as bran, whole wheat, copious water-drinking, fresh and cooked fruits and the use of vegetables and mineral oils will go far toward correcting this condition. If due to a sluggish peristalsis of the intestine these foods tend to irritate the walls of the alimentary canal and provoke a muscular action.

If constipation is due to too complete an absorption of water from the contents of the large intestine this can be corrected by the addition of foods which do not give up their water content readily, as agar-agar and cellulose.

Constipation Diet.

Breakfast: Fruit: apples, grapes, oranges, senna prunes.
Cereal: oatmeal.
Cream and butter in generous amounts.
Bread: black, rye, whole wheat and bran cakes.
Eggs: soft cooked or scrambled.
Coffee.

Dinner: Soup: preferably vegetable soup.
Fish or meat.
Vegetables: at least two kinds, preferably spinach, cabbage, beets turnips, potatoes, beans and peas.
Bread: same as breakfast.
Salad: green vegetable and Mayonnaise.
Dessert: agar jelly or fresh fruits.

Supper: Bread: same as breakfast.
Cold meat: vegetable salad.
Dessert: stewed fruit, pears, figs, senna prunes.
Cocoa.

Drink at least 3 pints of water daily. Omit all drugs for constipation. Eat 2 bran cakes at each meal. Give plenty of butter, cream and fruit.

RENAL DISTURBANCES.

Acute Nephritis.—This condition is apt to involve a lessening of the elimination of nitrogenous waste material. In an acute case the patient is subjected to a period of dietetic rest. If the case is very severe, small quantities of water alone may be given and, later on, a milk diet. Milk is a protein-containing food, but it is selected because of its ready digestibility and the comparatively simple form of its protein content.

Chronic Nephritis.—Acute nephritis may develop into the chronic form, with gradual improvement. In this event the patient is kept on a diet of moderate protein content, still sparing, in a degree, the organs of elimination.

Restricted Protein Diet.

Breakfast: Grapefruit; cream of wheat; toast and butter; cereal coffee, cream and sugar.

Dinner: Cream of spinach soup; toast strips; boiled potatoes; cauliflower; tomato salad with French dressing; chocolate blanc mange with whipped cream.

Supper: Baked rice; escalloped apple; celery; cinnamon toast; junket.

Milk or fruit juices may be given at 10 A.M., 2 P.M. and 8 P.M. if desired.

Renal Test Meal.—The presence of edema shows that water and sodium chloride are being retained. A Mosenthal test diet is given in which the protein and sodium chloride are measured to ascertain in what degree these substances are being retained.

Mosenthal or Renal Test Diet.

All food is to be salt-free food from the diet kitchen.

Salt for each meal will be furnished in weighed amounts.

All food or fluid served, but not taken, must be weighed or measured after meals and charted in space below.

Allow no food or fluid at any other than meal time.

Note any mishaps or irregularities that may occur in giving the diet or collecting the specimens.

Breakfast: 8 A.M.

Salt	5 gms.
Boiled oatmeal	100 gms.
Sugar	½ teaspoonful
Milk	30 gms.
Bread (2 slices)	60 gms.
Butter	20 gms.
Coffee, 160 gms. Sugar, 1 teaspoonful Milk, 40 cc.	200 cc.
Milk	200 cc.
Water	200 cc.

Dinner: 12 M.

Salt	5 gms.
Meat soup	180 cc.
Beefsteak	100 cc.
Potato (baked, mashed or boiled)	130 gm.
Green vegetables	as desired
Bread (2 slices)	60 gms.
Butter	20 gms.
Tea, 180 cc. Sugar, 1 teaspoonful Milk, 20 cc.	200 cc.
Water	300 cc.
Pudding (tapioca or rice)	110 gms.

Supper: 5 P.M.

Two eggs, cooked in any style	
Bread (2 slices)	60 gms.
Butter	20 gms.
Tea, 180 cc. Sugar, 1 teaspoonful Milk, 20 cc.	200 cc.
Water	300 cc.
Fruit (stewed or fresh)	1 portion
No salt.	

No food or liquid is to be given during the night or until 8 o'clock the next morning, when, after voiding urine, the regular diet is resumed.

Patient is to empty bladder at 8 A.M. and at the end of each period as indicated below. The specimens are to be collected, in properly labelled bottles, to be furnished by the chemical division of the medical clinic at the following hours: 8 A.M. to 10 A.M.; 10 A.M. to 12 M.; 12 M. to 2 P.M.; 2 P.M. to 4 P.M.; 4 P.M. to 6 P.M.; 6 P.M. to 8 P.M.; 8 P.M. to 8 A.M. Specimens are to be left in the ward until called for at 8.30 A.M. by attendant from the chemical division of the clinic.

Salt-free Diet.—The average intake of sodium chloride is from 10 to 15 grams daily. In a salt-free diet this can be cut to 1.5 grams. In nephritis with edema the patient is put upon a diet of unsalted food and the protein, with the exception of milk, is eliminated.

AMOUNT OF SALT IN A SALT-FREE DIET.

Food.	Amount, gms.	Salt, gms.	Water, gms.	Protein, gms.	Fat, gms.	Carbohydrate, gms.
			Breakfast.			
Oatmeal	60	0.0492	35.880	5.2300	4.860	13.100
Butter, salt-free	15	0.0165	1.650	0.1500	12.750	
Cream	100	0.1300	66.400	3.7000	25.700	3.550
Bread, salt-free	30	0.0460	10.590	2.7600	0.390	5.930
Peach sauce	90	0.0630	79.290	0.6300	0.090	9.720
Sugar	20	0.0220	..	..	..	19.988
			Dinner.			
Pineapple	110	0.0781	67.980	0.4400	0.770	40.040
Mayonnaise	21	..	0.840	0.2600	19.920	0.050
White sauce	90	0.0793	62.360	3.7400	13.880	9.000
Carrots	80	0.0800	74.600	0.4240	0.136	2.712
Butter, salt-free	30	0.0330	3.200	0.3000	25.500	
Bread, salt-free	30	0.0467	0.590	2.7600	0.390	15.930
Chocolate pudding	95	0.1502	53.450	4.9900	7.900	27.830
Cream	30	0.0390	17.900	1.1100	7.720	0.060
Fruit drink	236	0.0550	183.500	..	..	42.350
			Supper.			
Baked apple	120	..	88.670	0.6100	0.580	29.300
Brown sugar	10	0.0330	..	..	..	9.500
Cream	30	0.0390	17.900	1.1100	7.730	1.060
Bread, salt-free	30	0.0467	10.590	2.7600	0.390	15.930
Butter, salt-free	15	0.0165	1.650	0.1500	12.750	
Potato	10	0.0047	7.550	0.2500	0.010	2.090
Carrots	15	0.0150	14.010	0.1395	0.017	0.508
Cream	50	0.0975	34.200	1.8500	12.700	
Milk	50	0.0800	43.500	1.6500	2.000	2.500
Dates	41	0.0240	5.720	0.7900	1.040	29.300
Mayonnaise	21	..	0.840	0.2600	19.920	
Lettuce	5	0.1005	3.735	0.0060	0.001	0.114
Total	2317	1.1281	784.895	44.4195	175.325	283.593

Total calories, 2889.977.

SALT CONTENT OF FOODS[1] ACCORDING TO LEVA.[2]

PER CENT NaCl (RAW).

Meats.	
Mutton	0.170
Veal	0.130
Beef (lean)	0.110
Pork (lean)	0.100
Fish.	
Trout	0.120
Halibut	0.300
Cod	0.160
Salmon	0.060
Haddock	0.390
Poultry.	
Chicken	0.140
Turkey	0.170
Oyster (washed)	0.520
Oyster (with sea water)	1.140
Smoked and Salted Foods.	
Ham (raw)	5.000
Bacon (smoked)	1.011
Prepared Foods.	
Egg (whole)	0.210
Egg white	0.310
Egg yolk	0.030
Milk (whole)	0.160
Cream	0.130
Buttermilk	0.160
Whey	0.130
Condensed milk	0.400
Butter (unsalted)	0.110
Butter (salted)	
Parmesan cheese	1.930
Swiss cheese	2.000
American pale cheese	0.820
Pineapple cheese	2.130
Edam cheese	3.300
English cream cheese	0.920
Bread.	
Graham bread	0.610
White bread	0.440
Macaroni	0.060
Cereals.	
Barley	0.030
Oats	0.040
Wheat	0.010
Rice	0.030
Corn (maize)	0.010
Wheat flour	0.005
Oatmeal (American)	0.290
Quaker oats	0.080
Sago	0.190
Vegetables.	
Potatoes	0.040
Beets	0.050
Beans	0.099
Peas	0.050
Lentils	0.160
Lentils (dried)	0.150
Artichokes	0.300
Cauliflower	0.100
Cucumber	0.070
Radishes	0.070
Celery stalks	0.370
Celery roots	0.080
Asparagus	0.050
Spinach	0.170
Tomatoes	0.090
Cabbage	0.270
Onions	0.050
Canned Vegetables.	
Green corn[2]	0.400
Green peas[2]	0.700
Tomatoes[2]	0.100
Mushrooms	0.050
Fruits.	
Pineapple	0.07
Orange	0.030
Apricots	0.004
Lemon	0.004
Strawberry	0.010
Cherry	0.010
Olives	0.140

[1] Forchheimer: Therapeusis of Internal Diseases. (Courtesy of D. Appleton & Co.)

[2] Analysis from Atwater and Bryan.

Fruits.	
Plum	0.004
Gooseberry	0.120
Watermelon juice	0.011
Grape	0.024
Almonds, dry	0.010
Walnuts, dry	0.010
Cane sugar	0.110
Lump sugar	0.040
Chocolate	0.070

Spices.	
Vanilla	0.050
Cinnamon	0.060
Coffee (roasted)	0.040
Tea	0.150

Drinks.	
Ground water	0.003
Spring water	0.002

Prepared for Table.	
Thick soups	0.540
Roast beef	0.980
Roast pork	1.540
Chops	0.970
Roast chicken	0.390
Scrambled eggs (salted)	1.100
Spinach	0.910
Carrots	0.460
Cauliflower	0.490
Apple sauce	0.030
Stewed pears	0.010
Tapioca pudding (unsalted)	0.020
Rice with apples	0.180

CARDIAC CONDITIONS.

Decompensated Heart.—There are two classes of heart disturbance which suggest important dietetic considerations, the decompensated heart and the heart case with edema.

The diet for heart cases in general consists of simple foods of little bulk, since distention of the stomach is to be avoided. The use of laxative foods should be encouraged. Solid food should be carefully subdivided, so as to lesson the effort of mastication. Small and relatively frequent meals may be given. No stimulants, tea, coffee or cocoa, are permitted. Fluids should be limited, since elimination of large quantities increases the work of the heart.

Decompensated Heart with Edema.—The heart case with edema must be more rigidly dieted. Salt is to be excluded from the diet and the fluids restricted to 750 to 1000 cc. A modification of the "Karell diet" is commonly used. Milk, 200 cc, is given at 8 A.M., 12 M., 4 P.M. and 8 P.M. for five to seven days. Beginning on the eighth day the following plan of feeding is adopted:

1 A.M.	5 A.M.	9 A.M.	1 P.M.	5 P.M.
Milk, 200 cc One egg	Milk, 200 cc	Milk, 200 cc One shredded wheat biscuit One egg, soft-cooked, or One slice of toast, 40 gm. (salt-free) One butter ball, 15 gm. (salt-free)	Soup, chicken or tomato, 200 cc No salt Chopped meat, 100 gm. or Chicken, 150 g. Mashed potato, 100 gm. 1 soda cracker (salt-free)	Milk, 200 cc One egg, soft boiled or poached. One slice of salt-free bread, 40 gm. Rice or tapioca pudding, 100 gm.

All food must be salt-free. Sugar may be used as desired.

MISCELLANEOUS DISORDERS.

Anemia.—Apart from dietetic treatment, rest and a change of climate are beneficial to the patient. The causes of anemia must be considered in the dietetic care. If the condition is associated with kidney disturbance, water-drinking should not be forced, otherwise a prescribed quantity of fluids between meals is indicated. Mineral waters are used, especially those that are high in salt and iron. Iron is essential to the composition of the red blood cells. Organic iron is best supplied in fresh fruits and vegetables and in red meats, and these are important items in the diet. The proteins of beef in addition to the iron are important in promoting blood regeneration. Whipple and his collaborators of the University of California showed that meat was the best food and caused the most rapid blood regeneration after extensive and repeated hemorrhage in dogs.

Hypertension.—Hypertension requires a purin-free diet and easily digested food. Fluids must be restricted. All stimulating beverages are forbidden. If the hypertension is accompanied by edema the diet should be salt-free and

fluids closely restricted to $1\frac{1}{2}$ pints a day. Enough protein food is given to maintain the nitrogen balance, but proteins with harmless end-products, such as milk, eggs and cheese, are preferred.

Disorders of the Skin.—There is some uncertainty as to the importance of diet in skin cases. Authorities agree that the diet should be simple and easily digested. The exclusion of so many articles of dietary has been suggested as to indicate the need of a careful dietetic study of each individual case.

Eczema.—These patients may be placed on a milk diet or, if it is to continue for any length of time, bread and milk. This limits the patient to very easily digested foods. The following rice diet has been used very successfully in cleaning up cases of eczematous children.

Rice Diet.

Rice.
Egg.
Meat free from fat.
Tea, coffee, milk.
Salt and pepper.

Vegetables containing 3 per cent of carbohydrate material.

	Per cent.		Per cent.
Asparagus	3.3	Beet greens	3.2
Cooked	2.2	Lettuce	2.9
Beans, string, cooked	1.9	Pumpkin	5.2
Cabbage	5.6	Rhubarb	3.6
Cauliflower	4.7	Spinach:	
Celery	3.3	Fresh	3.2
Cucumber	3.1	Cooked	2.6
Egg-plant	5.1	Tomatoes	3.9

CHAPTER XXIX.

DIET UNDER SPECIAL CIRCUMSTANCES.

Diet in deficiency disturbances.
Diets in surgical cases.
Diet in pregnancy and lactation.
Cases requiring high caloric-feeding.

DIET IN DEFICIENCY DISTURBANCES.

Scurvy, pellagra, beriberi, rickets and xerophthalmia are conditions resulting from a faulty diet continued over an appreciable period of time. In each of these disorders some vital element has been lacking. In the laboratory, deficiency diseases can be produced by feeding animal foods lacking in certain principles and are cured by the addition of these principles if the experiments are not carried beyond the animal's power of recuperation.

The vitamin content of foods seem to be the controlling factor. A diet rich in raw fruits and vegetables, whole grains, butter, eggs and cream is a protection against the deficiency diseases.

Malnutrition may result from an inadequate diet, the individual maintaining a slow rate of growth and a low resistance to disease. This condition is prevalent among all classes of people, being the result of indifference as to food selection rather than poverty. It is especially important that correct eating habits are established in childhood to provide for the rapid growth at this period.

DIETS IN SURGICAL CASES.

Admission of Patient.—Unless otherwise specified a light or general diet is given up to the noon meal of the day before operation. Exceptions are made if there is an elevation of temperature, in acute abdominal conditions, in the event of nausea and vomiting or in acute throat conditions.

Preparatory Treatment.—When a general anesthesia is to be given, semisolid diet is given for the evening meal of the day before operation. Liquid diet is given in stomach cases. Water is given up to two hours before the operation. No breakfast is given on the day of the operation.

Local Anesthesia.—Unless otherwise specified follow the above directions. A light breakfast may be given if no abdominal work is to be done.

Postoperative Treatment.—Water in small quantities can usually be given by the mouth for two or three hours after the patient is entirely out of anesthesia. Hot water is preferable. If it has a tendency to nauseate or produce vomiting, it should be discontinued. Occasionally, in vomiting, a glass of warm water, with or without a small amount of sodium bicarbonate, will act as a lavage. This should not be given without special order. It should not apply to operations on the stomach or to cases of gastric dilatation.

In abdominal surgery, unless otherwise specified, Diet No. 1 may be used twenty-four hours after operation. At the end of the second twenty-four hours this may be supplemented by Diet No. 2. This should be continued until a cathartic has been given, usually about the third day. After this, Diet No. 3, followed by Diets Nos. 4 and 5, are indicated in turn. It is desirable to bring the patient back to a normal diet as quickly as possible. The problem of postoperative

feeding is directed to conditions which will aid in the recovery of the patient. Avoid such foods as require for their digestion the secretions that are postoperatively deficient.

A nephritic diet may be necessary following renal surgery. A gall-bladder case should be given a diet low in fats. Diet in toxemia should be simple and given frequently in small quantities. In acute dilatation of the stomach absolute rest is indicated, no food or fluids being given by the mouth.

In peritonitis, dietetic rest is indicated to quiet the peristalsis. Usually nothing is given by mouth, although bland and non-stimulating fluids are sometimes ordered by the physician. In stomach cases, as for example gastro-enterostomy, the diet varies with the case and is usually prescribed by the physician in charge. Water by mouth is not given for twelve to twenty-four hours postoperatively, and then in small amounts; 1 teaspoonful every half-hour, increased according to the tolerance of the patient. Nourishing beverages are started about forty-eight hours after the operation and are given frequently in small quantities, 1 teaspoonful to 2 teaspoonfuls every two hours. Select such foods as Vichy water, milk, gruels or broth. Sometimes a modified Sippy diet is ordered.

In operations upon the extremities, after the nausea and vomiting have ceased and when no complications are present, light or general diet may be given. In rectal cases, rest for three to five days is given, non-residual diet only being prescribed. After the cathartic a constipation diet is given.

In eye cases, semisolid diet is given twenty-four hours after the operation and continued for three or four days. In tonsil cases nothing is given by mouth for two hours and then any liquid or semisolid food. The following day diet may be increased with the improving condition of the throat.

Nutritive enemata:

(*a*) Raw egg, 1.
Salt, grains 15 (1 gram).
Peptonized milk, ounces 3.

(*b*) Raw egg, 1.
Beef juice, ounces 3.
Beat egg; add beef juice.

(*c*) Peptonized milk, ounces 3.
Beef juice, ounces 2.

Diet in Surgical Cases.

Diets to be used following surgical operations in general and to be given in succession:

Diet No. 1.—Liquid diet, but without milk. Fruit juices, fruit albumins, strained broths, tea, ginger ale, Vichy water.

Diet No. 2.—Milk, strained cream soups, custard, junket, koumyss, malted milk, gruels (strained), gelatin, peptonized milk, ice-cream, sherbet, buttermilk, cocoa, chocolate.

Diet No. 3.—Soaked toast and crackers, farinaceous desserts, tapioca, rice, bread pudding, blanc mange, sago pudding, cooked fruits with low acid content.

Diet No. 4.—Baked potato, salad vegetables, bacon, chicken, sweetbreads, oysters, scraped beef, squab, fish, raw fruits, excepting bananas.

Diet No. 5.—General diet. No fried foods, hot breads, pastry, coarse vegetables as turnips or cabbage, pork, veal or smoked meat.

DIET IN PREGNANCY.

In pregnancy a simple mixed diet is indicated. Avoid all foods that are difficult of digestion such as smoked or cured meats, pork, veal, hot breads, pastry, gravies, fried

foods, pickles, cucumbers, cabbage, and heavy desserts. The kidneys should be spared and meat given but once a day, and during the last month not at all. Cooked and raw fruits, fresh vegetables and coarse breads will tend to correct any tendency toward constipation. Copious water-drinking is advised.

During labor the patient is given a semisolid diet. If she is unable to take this, 200 cc of milk is given every two hours.

For the three days following delivery a semisolid diet is used. If the temperature is normal a general diet is given on the fourth day.

If there are kidney complications the diet is kept protein-free, and if the kidney condition is accompanied by edema the diet should be both salt-free and protein-free.

The idea exists that the size of the infant can be regulated by the prenatal diet. This is dangerous to the mother and may result in rickets in the child. Special dieting should never be entered into without the advice of the physician.

The Prochownick diet may be used during the last three months of pregnancy, but only by the advice of the physician, with the hope of producing a small, normal baby.

Prochownick Diet.

Breakfast: Small cup of black coffee, 100 cc. Toast or bread with a little butter, 25 grams.

Dinner: Meat; fish; egg; 1 green vegetable; salad or lettuce; cheese, ½ ounce.

Supper: Repeat dinner, add 40 to 50 grams with a little butter. Total fluids allowed per day, 300 to 400 cc.

Forbidden Absolutely.—Large quantities of fluids, potatoes, cereals, sugar and fats.

CASES REQUIRING HIGH CALORIC-FEEDING.

High caloric-feeding may be necessary for an emaciated patient or for one having a long convalescence, or in some lingering disease, as tuberculosis. The concentrated foods, such as finely divided fats, eggs and cereals, increase the food value of the diet.

This may be achieved by the addition of cream or whipped cream to fruits, desserts, beverages, soups or cereals; by the use of olive oil in connection with salads; by the addition of butter sauces to vegetables and the service of highly nutritious beverages between the meals.

High Caloric-feeding.

Breakfast: Baked apple with cream; cereals with cream and sugar; omelet; toast; marmalade; cereal coffee.

At 10 A.M. Milk.

Dinner: Cream of tomato soup, croutons; broiled steak; boiled potato; celery stuffed with cheese; rice pudding with cream.

At 2 P.M. Fruit juice and crackers.

Supper: Creamed chicken on toast; baked rice; lettuce sandwiches; chocolate blanc mange with whipped cream; sponge cake; cereal coffee.

At 8 P.M. Chocolate malted milk.

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INDEX.

A

Absorption, 25, 46
Acid-forming foods, 34
Acidosis, 33, 174
Acids, amino-, 25, 51, 53
  organic, 31, 34
Adipose tissue, 48, 177
Adolescence, 164
Adult, factors influencing food requirement of the, 54, 58
Agar jelly, 106, 149
Age, influence of, on food requirement, 55, 57, 163, 164, 165
Aids to digestion, 23, 168
Albumin milk, 158
Albumins, 50, 86
Albuminized fruit juice, 79
Albuminoids, 51
Algæ, 41
Alkalies, 33, 34, 47
Alkalinity of blood, 33
Almond cream, 103
  salad dressing, 116
Amino-acids, 25, 51, 53
Amylopsin, 25
Anabolism, 18
Anemia, 35, 44, 49, 192
Angel food cake, 125
  parfait, 114
Anti-neuritic vitamin, 20
Anti-ophthalmic vitamin, 20
Anti-rachitic vitamin, 20
Anti-scorbutic vitamin, 20
Apples, 109, 110
Apricot whip, 105
Arrowroot, 78
Artificial feeding of infants, 154–160
Ash, 35
Asparagus, 43, 97, 143, 145
Aspic jelly, 102
Assimilation, 25
Asthma, 52

B

Bacon, 133
Bacteria, 91
Baked custard, 88
  potato, 97
Baking, 123
  oven tests, 120
  powder biscuit, 121
Balanced meals, 24, 165
Bananas, 110
Barley, 77
Base forming food, 34
Batters, 119
Beans, string, 43
Beef, 128–133
  ash constituents of, 130
  beef broth, 132
    essence, 131
    juice, 131
  broiled steak, 132
  cuts of, 128
  food content of, 130
  composition of, 128
  preparation of, 128
  roast, 132
  scraped, 131
  vitamin content of, 20
Beet sugar, 39
Beriberi, 20, 42, 194
Beverages, 74–80
  acid, 74
  albuminized tea, 74
  albuminous, 74
  arrowroot gruel, 78
  barley water, 77
  bran water, 75

Beverages, cocoa, 77
coffee, 76
chocolate, 77, 79
shake, 79
cooked eggnog, 76
cracker gruel, 78
eggnog, 76
farina gruel, 78
farinaceous, 74
flour gruel, 78
fruit punch, 79
Irish moss lemonade, 75
lemonade, 75
oatmeal gruel, 78
stimulating, 74
tea, 76
Vichy or soda water, 75
Bile, 25, 49, 177
Blanc mange, 95
Blood, 21, 32
clotting of, 33
Body, elements of, 18
Boiled dressing, 117
Bone marrow, 44
Bran water, 75
agar cakes, 151
bread, 122
crackers, 151
muffins, 122, 151
Breads, 63
Breast milk, 90, 154
Broiled squab, 140
steak, 132
Broiling, 132
Bronchopneumonia, 170
Broth, 132, 141
Brussels sprouts, 43, 144
Bulbs, 40
Butter, composition of, 90
food value of, 65
vitamin content of, 20
Buttermilk, 90
mixture, 157

C

Cabbage, 99
Caffein, 76
Cake, 123–126
angel food, 125
baking, 123
care of, 124
classification of, 123
cocoanut puffs, 126
Cake, fruit cookies, 126
hot water sponge, 124
nut wafers, 126
sponge, 124
sunshine, 125
Calcium, 18, 33, 35
calcification in tuberculosis, 34
requirement in pregnancy and lactation, 35
in rickets, 34
source of, in food, 31–35
Caloric requirement of the individual, 54, 58
portions, 60, 62
value of food, 54, 60, 65
Calorie, defined, 54
Cane sugar, 39
Caramel custard, 106
ice-cream, 114
Carbohydrates, 37–43
absorption of, 41
caloric content, 54
classification of, 37
composition of, 19, 43
diet low in, 43
dietetic uses, 42
digestion of, 41
function of, 19
occurrence of, in body, 42
source of, 37
tolerance of, 39
uses of, to body, 42
Carbon, 18
dioxide, 41
Carbonates, 31, 34
Cardiac cases, 191
Carrots, 97, 98
Casein, 25
milk, 158
Catabolism or Katabolism, 18
Cauliflower, 43, 144
Celery, 43, 115, 143
Cellu-bran crackers, 150
muffins, 150
Cellulose, 37, 38
Cereal mixture, 159
Cereals, 39, 63, 95
Certified milk, 91
Cheese, 90
rarebit, 150
Chemical analysis of body, 18
digestion, 25, 53
Chicken, 137–141. *See* Poultry.
a la Maryland, 140

Chicken broth, 141
Children, food requirements of, 55, 160, 194
  rate of growth of, 163, 194
Chlorine, 18
Chocolate, 77, 79
  ice-cream, 113
Chops, 133
Chromo-proteins, 51
Cleaning, methods of, 69
Climate, influence of, on food requirement, 56
Cocoa, 77
Cocoanut puffs, 126
Cod, baked, 146
Coddled eggs, 87
Coffee, 76
  ice-cream, 149
  jelly, 148–149
Concentrated food, 199
Condiments, 22
Conjugated protein, 44
Constipation, 29, 185
Convalescent diet, 42, 49, 199
Cookery, 66
Corn, cream of, 83
Cornstarch, 95
Cottage cheese, 94
Cranberry frappe, 113
Cream, 90
  sauce, 81
  soups, 82–85
    asparagus, 84, 143
    cauliflower, 85
    celery, 82, 143
    corn, 83
    pea, 84
    potato, 84
    preparation of, 82
    rice, 84
    spinach, 83
    tomato, 83
Creamed egg, 87
Cress, 115, 118
Cucumber, 115, 144
Custard, 88
  baked, 88, 148
  caramel, 108
  chocolate, 108

D

Dainty, 105
Dairy products, 65
Dandelions, 43, 144
Date pudding, 105
Dates, 39
Decline, 165
Deficiency diseases, 20, 42, 194
Desserts, 104–110
  agar jelly, 106
    with saccharin, 106
  apple snow, 109
  apples, baked, 109
    cuban style, 110
  apricot whip, 105
  banana, baked, 110
  caramel custard, 106
  chocolate custard, 108
  dainty, 105
  date pudding, 105
  lemon meringue, 107
    rice pudding, 104
    sponge, 105
  maple cream toast, 107
  orange pudding, 107
  prune whip, 105
  senna prune, 110
  strawberry fluff, 106
  tapioca cream, 104
  value in dietary, 104
  walnut maple souffle, 104
Dextri-maltose, 159
Dextrin, 37, 38
Dextrose, 25, 37
Diabetes, 42, 49, 113
  carbohydrate tolerance in, 173
  diabetic recipes, 142
  dietetic treatment, 173, 176
  Joslin's diet for, 174
Diarrhea, 49
Diastase, 38, 39
Dietary conditions of the sick, 166
  for a child, 35, 48
Dietetic classes, 73
Dietetics, defined, 17
Diets, acute fever, 170
  adequate, 58, 165
  anemia, 35, 49, 192
  asthma, 52
  constipation, 29
  convalescent, 42, 49, 199
  decompensated heart, 191
  deficiency disturbances, 20, 42, 194
  diabetic, 42, 49, 173, 176
  dysentery, 184
  eczema, 193

Diets, edema, 35, 186, 191, 192
emaciation, 42, 199
fat-free, 177
fevers, 29, 170
for children, 154
for various periods of life, 154
forced feeding, 42, 49, 199
gastric atony, 181, 182
ulcer, 183
gastritis, 49, 181
gastro-enteritis, 182
general, 167
gout, 31, 179
hypertension, 52, 192
indigestion, 29
"Karel," 191
lactation, 000
light, 167
liquid, 74, 167
liver, 49, 177
milk, 154
mucous colitis, 182
nephritis, 29, 186, 189
obesity, 42, 177, 178
postoperative, 195
pregnancy, 35, 197
preoperative, 195
Prochownick, 198
purin-free, 52, 179
rice, 193
rickets, 20, 34, 49, 198
salt-free, 35, 188, 189, 191
semi-solid, 167
skin cases, 52, 193
surgical cases, 195
typhoid, 170
Digestion, 23, 32
aids to, 23
chemical, 24
physical, 24
Digestive disturbances, 49
Disaccharids, 37
Dish washing, 70
Distillation of water, 29
Dysentery, 184

E

Eczema, 193
Edema, 28, 32, 35, 186, 191, 192
Egg-plant, 43, 145
Eggs, 86–89
baked, 87
Eggs, custard, 88
beef tea custard, 89
coddled, 87
composition of, 86
creamed, 87
digestibility of, 86
egg nest, 87
eggnog, 76
foamy omelet, 88
poached, 87
preservation of, 86
Eiweiss milk, 158
Elements in body, 18, 34
Elimination, 26
Emaciation, 42, 199
Emetic, 29
Emulsification, 47
Endive, 43, 115
Energy, 17
Enteritis, 182
Enzymes, 24, 25, 33
acting on carbohydrates, 25
on fats, 25
on proteins, 25
classification of, 25
source of, 24
table of, 25
Erepsin, 23, 53
Errors in diet, 194
Esthetic value of food, 21, 66
Eye cases, 196

F

Fahrenheit scale, 68
Farina, 78
Fat soluble A vitamin, 20, 48
effect of heat upon, 20
function of, 20
foods containing, 20
Fats, 19, 44–49
absorption of, 47
caloric value of, 54
cause of gastro-intestinal disturbances, 49
characteristics of, 46
composition of, 44
dietetic uses, 48
digestion of, 46
effect of heat upon, 45, 46
enzymes acting upon, 25
fat-free diet, 177
fixed, 44

Fats, functions of, in body, 19
occurrence of, in body, 48
source of, 44
utilization of, 45
vitamin content of, 20
volatile oils, 44
Fatty acids, 25, 45
Feeding, forced, 42, 49
by rectum, 197
infant, 154
postoperative, 195
preoperative, 195
Fevers, 29
acute, 170
long duration, 170
typhoid, 42, 170, 171, 172, 173
Figs, 39
Filtration of water, 30
Fish, 134–136
composition of, 65
haddock, 135
halibut, 135
nutritive value of, 134
pigs in blankets, 135
planked white, 136
preparation of, 134
selection of, 134
stuffing of, 135
Flour, 63, 120, 12
mixtures, 119–122
baking powder biscuit, 121
batters, 119
bran bread, 122
muffins, 122
digestibility, 119
health bread, 122
nut bread, 122
popovers, 121
shortcake, 121
toast, 119
Fluorine, 18
Foamy omelet, 88
Food, 17
acid forming, 34
adjuvants of, 22
ash constituents of, 35, 36
base forming, 34
caloric value of, 54
care of, 155, 168
chemical digestion of, 25
classification of, 18
composition of, 18
defined, 17
diabetic, 143
Food, distribution of, 21
effect of heat upon, 66
fuel value of, 54
functions of, 17
idiosyncrasies, 164
incomplete, 101
preparation, 21, 66
purin content of, 180
requirements, 54, 58
selection of, 21, 67
service of, 21
vitamin content of, 20
Forced feeding, 42, 49, 199
Fowl. *See* Poultry.
Fractures, 33
French dressing, 116
Frozen mixtures, 111–114
angel parfait, 114
caramel ice-cream, 114
chocolate ice-cream, 113
cranberry frappe, 113
grape frappe, 113
lemon ice, 111
maple parfait, 114
mousse, 114, 149
orange ice, 112
Philadelphia ice-cream, 113
pineapple frappe, 112
raspberry ice, 112
rose petal mousse, 114
strawberry ice, 112
vanilla ice-cream, 113
white velvet sherbet, 112
Fructose, 39
Fruit, 34, 40
albumen, 79
cookies, 125
preparation of, 108
punch, 79
salad, 117
vitamin content of, 20
Fuel value of food, 54
Function of food, 17
Fungi, 41

G

Galactose, 25, 37, 39
Gall-bladder, postoperative diet, 196
Garbage can, care of, 72
Garnishes, 136
Gastric atony, 181, 182

Gastric disturbances, 49, 181
juice, 25, 53
ulcer, treatment of, 183
Gastritis, 49, 181
Gastro-enteritis, 182
Gastro-enterostomy, 196
Gastro-intestinal disturbances, 49, 181
tract, 25
Gelatin, 51, 101–103
almond cream, 103
aspic jelly, 102
food content of, 101
imperial pudding, 102
lemon jelly, 102
preparation, 101
snow pudding, 103
springtime salad, 101
tomato jelly, 101
General diet, 167
Globulins, 50, 86
Glucose, 39
Gluteline, 50
Gluten, 120
Glycerin, 25, 45
Glycogen, 38, 42
Glyco-proteins, 51
Goiter, 179
Gout, 31, 179
Gram scale, 143
Grape frappe, 113
fruit, 43, 109
Grapes, 39
Greens, 40, 63
Growth of, 20, 48
Gruels, 78
Gums, 38

H

Haddock, 135
Halibut, 135
Hard water, 27
Health bread, 122
Heat, effect on foods, 20, 46, 51, 95
Hemoglobin, 33
High caloric diet, 42, 199
in typhoid, 172
in tuberculosis, 199
Histones, 51
Hollandaise sauce, 100
Honey, 39
Hoos' albumin milk, 160
Hospital diets, 167
Household measurements, 67
Human milk, 90, 154
Hydrocarbons, 46
Hydrogen, 18
Hypertension, 52, 192

I

Ice-cream. *See* Frozen mixtures.
Ices. *See* Frozen mixtures.
Imperial pudding, 102
Indigestion, 29
Infancy, 154
Infant feedings, 154
Inorganic foods, 18
salts, 31
Intestinal digestion, 25
tract, 25
Iodin, 18, 179
Irish moss, 41, 75
Iron, 18, 31
in the blood, 33
sources of, in food, 31, 35, 192

J

Jellied chicken, 140
Joslin's treatment of diabetes, 174
Junket, 93

K

Karel diet, 191
Karo syrup, 159
Katabolism, 18
Kidneys, 52
in nephritis, 186, 196
Kilogram, 54
Koumyss, 90, 92, 197

L

Laboratory, care of, 69
Lactase, 25
Lactation, 197
Lactic acid milk, 159
Lactose, 37, 38
Lamb chops, 133
Laxatives, 48, 49

Leavening agents, 119
Lecithin, 44, 86
Lecitho-proteins, 51
Lemon ice, 111
  jelly, 102
  meringue, 107
  rice pudding, 104
  sponge, 105
  whey, 93
Lemonade, 75
Lettuce, 115
Leukocytes, 25
Levulose, 25, 37, 39
Lichens, 41
Light diet, 167
Lipase, 25
Liquid diet, 74, 167
Lithia water, 31
Liver, 49, 177
  dietetic treatment for, 49, 177
Lymph, 22

M

Magnesium, 18
Maitre d'hotel butter, 133
Malnutrition, 42, 49, 194
Malt soup, 157
Maltase, 25
Malted milk, 93
Maltose, 25, 37, 38
Maple cream toast, 107
  parfait, 114
Mastication, 24, 53
Maturity, 164
Mayonnaise, 117
Meals, service of, 166
Measles, 170
Measures and weights, 60, 68
Meats, 128–133
  ash constituent of, 34, 130
  beef broth, 132
    essence, 131
    juice, 131
    roast, 132
    scraped, 131
  broiled bacon, 133
    steak, 132
  chops, 133
  composition of, 130
  cookery of, 130
  cuts of, 128
  definition of, 128
Meats, pan broiled bacon, 133
  selection of, 130
  vitamins, 20
Menu for one day, 58
Metabolism, 18, 26, 32
Meta-proteins, 51
Metric system, 67
Milk, 90–94
  breast *versus* cow's milk, 90
  certified, 91
  composition of, 90
  cottage cheese, 94
  digestibility of, 91
  diet, 186–191
  food content of, 90
  junket, 93
  koumyss, 92, 197
  lemon whey, 93
  malted, 93
  mixtures, 154–160
  pasteurized, 91
  peptonized, 92
  shake, chocolate, 79
  soups, 82
  souring of, 91
  sterilization of, 91, 92
  sugar, 37, 38
  use in nephritis, 186
  vitamin content of, 20
Mineral matter, 19, 35
    dietetic uses of, 34
    occurrence in body, 31
    relation of, to deficiency diseases, 34
    sources of, 31
    uses of, in the body, 32
  metabolism, 32
Mixed diet, 24
Modified recipes, 142–153
    asparagus, cream of, 143
      loaf, 145
    baked custard, 148
    bran and agar cakes, 151
      crackers, 151
      pancakes, 152
    Brussels sprouts, 144
    cauliflower, 144
    celery, cream of, 143
      stuffed, 147
    cellu-bran crackers, 150
      muffins, 150
    cheese rarebit, 150
    cod, baked, 146
    coffee agar jelly, 149

Modified recipes, coffee jelly, 148
ice-cream, 149
cucumber, 144
dandelions, 144
diabetic bran muffins, 151, 152
cookery, 142
egg-plant, 145
junket, 148
lemon jelly, 148
milk, 158
minced meat, 146
mosquitoes, 146
mousse, 149
mushrooms, 144
orange agar jelly, 149
peppers, green, 145
soup, vegetable, 153
springtime salad, 147
thrice cooked vegetables, 153
tomatoes, stuffed, 145
snow pudding, 147
Monosaccharids, 37
Mosenthal diet, 187
Motor meal, 181
Mousse, 114–149
Mouth, 25
Mucous colitis, 182
Muffins, 150
Mumps, 170
Mushrooms, 41, 144

N

Nephritic diet, 186, 196
Nephritis, 29, 186
acute, 186
Neuritis, 20
Nitrogen, 18
balance, 21, 48
in food, 50
Nitrogenous waste, 29
Nucleo-protein, 51
Nursery formula, 158
Nutritive enemata, 197

O

Oatmeal gruel, 78
water, 157
Obesity, 42, 177, 178
Olein, 45
Olive oil, 199
Osmotic pressure, 32

P

Palmitin, 45
Pancreatic juice, 45
Pellagra, 194
Peppers, 145
Pepsin, 25, 53
Peptids, 51
Peptones, 25, 51, 53
Peptonized milk, 92
Periods of life, 154, 163
Peristalsis, 25, 42
Peritonitis, 196
Philadelphia ice-cream, 113
Phospho-proteins, 51
Phosphorus, 18, 31, 35
Pineapple frappe, 112
Pineappleade, 75
Planked white fish, 136
Plasma, 22
Pneumonia, 170
Poached eggs, 87
Poisoning of food, 52
Polypeptids, 25, 53
Polysaccharids, 37
Popovers, 121
Postoperative feeding, 195
Potassium, 18, 31
Potatoes, 96, 97, 98
Poultry, 137–141
broiled chicken, 139
chicken a la Maryland, 140
broth, 141
composition of, 65
digestibility of, 137
jellied chicken, 140
mock fried, 140
preparation of, 137
roast chicken, 139
selection of, 137
squab, 140
stuffing of, 139
Pregnancy, 35
diet in, 197
Preparation of food, 21, 154
of the tray, 168
Preoperative feeding, 195
Prochownick diet, 198
Protamines, 51
Protein milk, 158
Proteins, 19, 50–53
ash constituent of, 35, 50
caloric value of, 54
characteristics of, 51

Proteins, classification of, 50
composition of, 50
conjugated, 44, 51
derived, 51
description of, 50
dietetic uses of, 52
digestion of, 25, 52, 53
function of, in body, 52
in nephritis, 186
requirements, 165
simple, 50
sources of, 50
test for, 51
Proteoses, 25, 51, 53
Prune whip, 105
Prunes, senna, 110
Ptyalin, 25
Pumpkin, 43
Punch, 79
Purin content of foods, 180
Purin-free diet, 52, 179
Putrefaction of protein, 52

R

Radishes, 115
Raspberry ice, 112
Rectal feeding, 197
Refrigerator, care of, 72
Renal disturbances, 186
Rhubarb, 43
Rice, 99
diet, 193
Rickets, 20, 34, 49
Roast beef, 132
chicken, 139
Roots, 40, 60
Rose petal mousse, 114
Roughage, 23
Rules for feeding patients, 166

S

Saccharin, 142
Salads, 115–118
composition of, 115
cress, 118
dressings for, 116
food value of, 115
fruit, 117
preparation of, 115
Swiss, 117
Salads, vegetable, 118
Saliva, 25
Salivary digestion, 24, 25
Sauce, Hollandaise, 136
tartar, 136
Salt, 31
content of foods, 190
Salt-free diet, 35, 188, 189, 191
Salts, 45
Saponification, 47
Scarlet fever, 170
Scraped beef, 131
Scurvy, 20, 42, 194
Semi-solid diet, 167
Service of food, 167
Sex, influence of, on food requirement, 57
Shellfish, 65
Shortcake, 121
Silica, 18
Sink, care of, 71, 72
Sippy diet, 184
Skin cases, 52, 193
Small intestine, 25
Sodium, 18, 31, 33, 35
Soft cooked eggs, 87
water, 27
Soups, cream, 82, 143, 153
Snow pudding, 103
Special diets. *See* Diets.
Spices, 22
Spinach, 20, 98
Sponge cake, 124
Springtime salad, 101
Squab, 140
Squash, 43
Standard graduate, 143
Starch, 37, 38
digestion of, 25
preparation of, 95
Starvation treatment, 174, 175
Steapsin or lipase, 25
Stearin, 45
Sterilization, 30, 91, 92
Stimulating beverages, 22
Stomach, 25
Strawberry fluff, 106
ice, 112
String beans, 43
Stuffing, 135, 139
Sucrase, 25
Sucrose, 37, 38
Sugar, 37, 38
composition of, 63

Sulphur, 18, 31, 34
Sunshine cake, 125
Surgical cases, 195

T

Tapioca cream, 104
Tea, 76, 79
Test meals, 186
Thein, 76
Theobromin, 77
Thermometry, 68
Thrice cooked vegetables, 153
Toast, 119
Tomatoes, 43, 99, 101, 115, 145
Tonsil cases, 196
Tray, 166, 169
Truffles, 41
Tryptophan, 101
Tuberculosis, 34
  dietetic treatment of, 49, 52, 199
Tubers, 40
Turnips, 98
Typhoid, dietetic treatment of, 170–173
  specimen diets, 172
Tyrosin, 101

U

Urea, 50
Uric acid, 50, 179
Urinalyses, 174, 188

V

Vanilla ice-cream, 113
Vegetables, 96–100, 144
  asparagus, 97, 143
  content of, 43
  carrots, 97, 98
  onions, 97, 98
  potatoes, baked, 97
    boiled, 96
    mashed, 96
    scalloped, 97
  preparation of, 96
  rice, 99
  salad, 118
  soup, 153
  spinach, 98
Vegetables, thrice cooked, 153
  tomatoes, 99, 101, 115
  turnips, 98
Vichy water, 75
Villi, 25
Vitamins, 20, 48, 154, 194
Vitellin, 44
Volatile oils, 44

W

Walnut maple souffle, 107
Walnuts, 43
Water, 19, 27–30
  boiling point of, 68
  classification of, 27
  cress, 115, 118
  dietetic uses of, 29
  freezing point of, 68
  melon, 43, 109
  mineral, 31
    C vitamin, 20
  occurrence of, in the body, 28
  purification of, 29
  quantity required, 28
  soluble B vitamin, 20
  sources of, 27
  uses of, in the body, 28
Weight, influence of, on food requirement, 55
Weights and measures, 67
  of children, 163
  of rations of food, 60, 62
Wheat, 120
Whey, 93
White velvet sherbet, 112
Women, food requirement of, 57
Work, 54, 56

X

Xerophthalmia, 20, 194

Y

Yeast, 20

Z

Zwieback, 119